MATHS

BOOKS - OSWAL PUBLICATION

DIKSHA QUESTIONS

Unit I Number System Real Number Multiple Choice Questions

1. The decimal representation of $\frac{11}{2^3 \times 5}$ will

A. 1

B. 2

C. 3

D. non terminating number

Answer: B

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2. $2.\overline{35}$ is a

A. rational number

B. irrational number

C. a terminating decimal number

D. both (a) and (c)

Answer: A

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3. If HCF of two numbers is 1 , the number are called relatively _____

or _____

A. prime , coprime

B. composite ,prime

C. both (a) and (b)

D. none of these

Answer: A

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4. For what least value of 'n, a natural number $(24)^n$ is divisible by 8 ?

A. 0

B. -1

C. 1

D. no value of n is possible

Answer: C

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5. $7 \times 11 \times 13 \times 15 + 15$ is a

A. composite number

B. prime number

C. whole number

D. both (a) and (c)

Answer: D

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6. The HCF of 5^{13} and 2^{26} is

A. 0

B. 1

C. 13

D. 26

Answer: B

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7. After how many place will decimal expansion of $\frac{294}{1200}$ terminate ?

A. 2

B. 3

C. 4

D. will not terminate

Answer: B

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8. Given positive integers x and y such that x = $my + n$, where m and n are unique integers then :

A. n=1

B. $0 < n \leq y$

C. $0 \leq n < y$

D. $n > y$

Answer: B

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9. Two positive integer a and b are written as $a = x^3y^2, b = xy^3$, the LCM of (a,b) is

A. x^3y^3

B. xy^2

C. x^2y^2

D. xy^3

Answer: A

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10. Given that HCF (306, 657) = 9, find LCM (306, 657).

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11. Check whether 6^n can end with the digit 0 for any natural number n .

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12. Given that HCF (96,404) is 4, find the LCM (96,404)

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13. If 6.249 is expressed in the form $\frac{p}{q}$, what can you say about q ?

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14. If $2.3\overline{47}$ is expressed in the $\frac{p}{q}$, what can you say about q ?

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15. Can 15^n end with the digit 0 , for any natural number n . Justify your answer .

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16. Without actual division , find the decimal representation of $\frac{39}{100}$.

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17. Fundamental Theorem of Arithmetic

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18. Is $13 \times 19 \times 29 + 29$ prime or composite ? Justify .

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19. Are the smallest prime and the smallest composite number coprime ? Justify .

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20. The LCM and HCF of two natural number is 12 and 2 respectively. If one numbers is 4 . Find the other numbers .

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21. If two positive integers a and b are expressible in the form $a = pq^2$ and $b = p^3q$; $p,\ q$ being prime numbers, then LCM $(a,\ b)$ is pq (b) p^3q^3 (c) p^3q^2 (d) p^2q^2

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22. Let $x = \frac{7}{20 \times 25}$ be a rational number . Then x has decimal expansion which terminates :

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Unit I Number System Real Number Short Answer Type Questions

1. If $(x-3)$ is the HCF of x^3-2x^2+px+6 and x^2-5x+q, find $6p+5q$

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2. Can the HCF and LCM of two numbers be 27 and 288 ?

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3. Show that $3+\sqrt{2}$ is an irrational number.

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4. Prove that $2\sqrt{3}-5$ is irrational .

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Unit I Number System Real Number Long Answer Type Questions

1. Show that reciprocal of $3 + 2\sqrt{2}$ is an irrational number

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2. Three bells toll at intervals of 12 minutes , 15 minutes and 18 minutes respectively . If they start together , after what time will they next toll together ?

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3. Show that $\left(\sqrt{3} + \sqrt{5}\right)^2$ is an irrational number .

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4. Find whether decimal expansion of $\frac{13}{64}$ is a terminating or non - terminating decimal . If it terminates , find the number ofdecimal places its decimal .

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5. Write the HCF and LCM of smallest odd composite number and the smallest odd prime number . If an odd number p divisible q^2 , then will it divide q^3 also ? Explain .

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6. Prove that $\sqrt{5}$ is an irrational number . Hence prove that $3\sqrt{5}+7$ is an irrational number .

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7. Prove that $3 + 4\sqrt{3}$ is an irrational number .

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Unit Ii Algebra Polynomials Multiple Choice Questions

1. Degree of the polynomial $2x^4 + 3x^3 - 5x^2 + 9x + 1$ is

A. 3

B. 1

C. 2

D. 4

Answer: D

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2. The zeroes of a polynomial $x^2 + 5x - 24$ are

A. one positive and one negative

B. both positive

C. both negative

D. both equal

Answer: A

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3. If one of the zeroes of the cubic polynomial $ax^3 + bx^2 + cx + d$ is zero, the product of the other two zeroes is :

A. $\frac{-c}{a}$

B. $\frac{c}{a}$

C. 0

D. $\frac{-b}{a}$

Answer: B

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4. A quadratic polynomial , whose zeroes are -3 and 4 is

A. $x^2 - x + 12$

B. $x^2 + x + 12$

C. $2x^2 + 2x - 24$

D. $\frac{x^2}{2} - \frac{x}{2} - 6$

Answer: D

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5. If one root of the equation $(k-1)x^2 - 10x + 3 = 0$ is the reciprocal of the other, then the value of is_____ .

A. 3

B. 4

C. 1

D. none of these

Answer: B

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6. The zeroes of the polynomial $x^3 - 2x^2 - x + 2$ are

A. $0, 2, 1$

B. $1, 2, -1$

C. $1, -2, -1$

D. $1, -2, 1$

Answer: B

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7. What will be the degree of the remainder if $3y^4 - 6y^2 - 8y - 5$ is divided by a quadratic polynomial?

A. 3

B. 2

C. 1

D. 1 or 0

Answer: D

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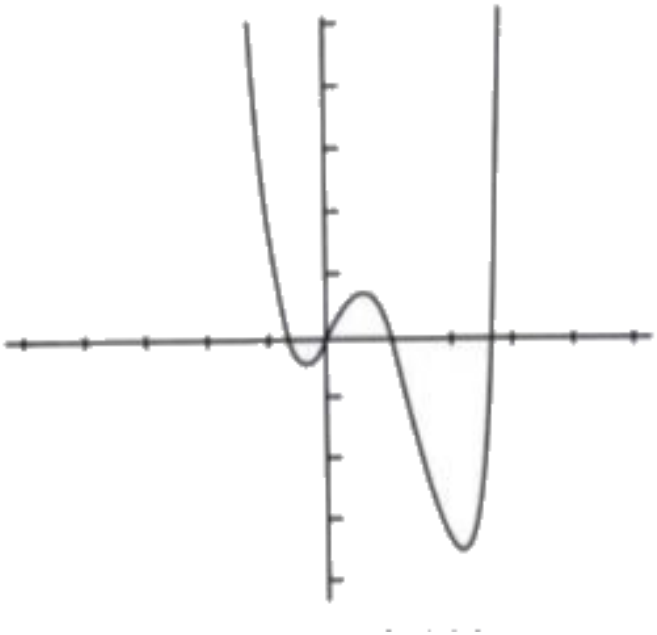
8. The graph of polynomialp(x) is shown .



The number of zeroes of p(x) is :

A. 3

B. 4

C. 5

D. 6

Answer: B

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9. The polynomial $y = p(x)$ intersects the axes at $(-3, 0), (0, 1), (1, 0)$ and $(3, 0)$

Find the zeroes of the polynomial are :

A. $-3, 0, 3$

B. $-3, -1, 0$

C. $-3, 1, 3$

D. $-1, 0, 1$

Answer: C

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10. If one zero of the quadratic polynomial $x^2 + 3x + k$ is 2 then the value of k is

A. 10

B. -10

C. 5

D. -5

Answer: B

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Unit Ii Algebra Polynomials Very Short Answer Type Questions

1. A teacher after teaching the chapter polynomial in class 10th , wrote the sum and product of zeroes respectively on the blackboard to test the skill grasped by his students .Find out the polynomials that the teacher has in his mind .

A. 2 and $\sqrt{2}$

B. $2-\sqrt{2}$ and $2-\sqrt{7}$

C. $\sqrt{3}$ and $-\sqrt{5}$

D. $\frac{2}{3}$ and $-\frac{1}{2}$

Answer:

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2. Read the following passage and answer the questions that follows

:

A teacher told 10 students to write a polynomial on the black board.

Students wrote

1.	x^2+2	6.	$x-3$
2.	$2x+3$	7.	x^4+x^2+1
3.	x^3+x^2+1	8.	x^2+2x+1
4.	x^3+2x^2+1	9.	$2x^3-x^2$
5.	x^2-2x+1	10.	x^4-1

(i) How many students wrote cubic polynomial

(ii) Divide the polynomial $\left(x^2+2x+1\right)$ by $(x+1)$.

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3. Zeroes of a polynomial p(y) is _____ of the point , wherethe grapth intersects the y - axis .

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4. Find the zeroes of $x^2 + 15x = 0$.

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5. If sum and product of the zeroes of $ky^2 + 2y + 3k$ are equal , find k .

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6. What type of a graph will be represented by the polynomial $-3x^2 + 5x + 4$?

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7. If one of the zeros of the quadratic polynomial f(x) = $4x^2 - 8kx - 9$ is equal in magnitude but opposite in sign of the other, find the value of k.

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Unit Ii Algebra Polynomials Short Answer Type Questions

1. Obtain all the zeroes of the polynomial $x^4 + 4x^3 - 2x^2 - 20x - 15$, if two of its zeroes are $\sqrt{5}$ or $-\sqrt{5}$.

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2. A quadratic equation $2x^2 - 3x + !$ has zeroes as α and β Now form a quadratic equation whose zeroes are 3α and 3β

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3. Find the zeroes of the quadratic polynomial $3x^2 - 2$ and verify the relationship between the zeroes and the coefficients .

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4. If α, β, γ are zeroes of polynomial $6x^3 + 3x^2 - 5x + 1$, then find the value of $\alpha^{-1} + \beta^{-1} + \gamma^{-1}$.

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5. Obtain all the zeroes of the polynomial $x^4 + 4x^3 - 2x^2 - 20x - 15$, if two of its zeroes are $\sqrt{5}$ and $-\sqrt{5}$

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6. If the zeroes of a polynomial $x^2 - 8x + k = 0$, are the HCF of (6,12) , then find the value of k .

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7. Find the zeroes of the quadratic polynomial $x^2 - 36$ and verify the relationship between the zeroes and the coefficients .

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8. Find the quadratic polynomial whose sum of the zeroes is 8 and one zero is $4 + 2\sqrt{3}$.

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9. At how many points will the polynomial $x^3 + 8$ intersect the x-axis ?

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Unit Ii Algebra Polynomials Long Answer Type Questions

1. If α and β are the zeroes of the polynomial $x^2 + 6x + 9$ then form a polynomial whose zeroes are $-\alpha$ and $-\beta$

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2. If one zero of the quadratic polynomial f(x) = $4x^2 - 8kx + 8x - 9$ is negative of the other , then find the zeroes of $kx^2 + 3kx + 2$.

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3. Find the zeroes of the quadratic polynomial $3x^2 - 2$ and verify the relationship between the zeroes and the coefficients .

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4. For each of the following , find a quadratic polynomial whose sum and product respectively of the zeroes are as given . Also find the zeroes of these polynomial by factorisation .

(i) $\frac{-8}{3}, \frac{4}{3}$ (ii) $-2\sqrt{3}, -9$

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5. Obtain all the zeros of the polynomial $f(x) = 3x^4 + 6x^3 - 2x^2 - 10x - 5$, if two of its zeros are $\sqrt{and} - \sqrt{\frac{5}{3}}$

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6. Find the zeroes of the polynomial $x^2 + \frac{1}{6}x - 2$ Hence verify the relationship between the zeroes and the coefficients.

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7. 4 chairs and 3 tables cost Rs 2100 and 5 chairs and 2 tables cost Rs 1750. Find the cost of a chair and a table separately.

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8. $\frac{5}{x-1}+\frac{1}{y-2}=2$ and $\frac{6}{x-1}-\frac{3}{y-2}=1$ then find the values of x and y

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9. $6(ax+by)=3a+2b$ & $6(bx-ay)=3b-2a$

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10. Solve:

$$\frac{1}{x}+\frac{3}{y}=9$$
$$\frac{1}{x}-\frac{4}{y}=2$$

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11. Solve for (x, y): $2x-3y=5, 3x+4y=-1$.

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12. In a two digit number , the digit in the unit place is twice of the digit in the tenth place . If the digits are reversed , the new number is 27 more than the given number . Find the number

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13. Students are made to stand in rows . If one student is extra in a row there would be 2 rows less . If one student is less in a row there would be 3 rows more . Find the number of students in the class .

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14. Graphically, solve the following pair of equations

$2x+y=6$ and $2x-y+2=0$

Find the ratio of the areas of the two triangles formed by the lines representing these equations with the X-axis and the lines with the y-axis.

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15. Solve the following system of equations by method of cross-multiplication:

$(a+2b)x+(2a-b)y=2, \quad (a-2b)x+(2a+b)y=3$

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16. Solve the following questions.

(ii) A train travels 360 km with uniform speed.The speed of the train is increased by $5km/hr$, it takes 48 minutes less to cover the same distance. Find the initial speed of the train.

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17. Solve the following pair of linear equations in 2 variables:

$$\frac{x}{a}+\frac{y}{b}=a+b \text{ and } \frac{x}{a^2}+\frac{y}{b^2}=2$$

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18. A boat covers 32 km upstream and 36 km downstream in 7 hours . In 9 hours it cancover 40 km upstream and 48 km downstream.find the speed of the stream and that of the boat in still water .

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19. A man travels 600 km partly by train and partly by car . It takes 8 hours and 40 minutes if he travels 320 km by train and the rest by car . It would take 30 minutes more if he travels 200 km by train and the rest by car , Find the speed of the train and the car.

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20. Solve the following system of equations graphically :

$4x - 3y + 4 = 0$

$4x + 3y - 20 = 0$

Area find the area of the triangle formed between the lines and the x - axis .

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21. Two places 'A' and 'B' are 120 km apart from each other on a highway .A car starts from 'A' and another from 'B' at the same time . If they move in the same direction , they meet in 6 hours and it they move in opposite direction , they meet in 1 hour and 12 minutes .Find the speed of each car .

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22. 8 men and 12 boys can finish a piece of work in 5 days, while 6 men and 8 boys can finish it in 7 days. Find the time taken by 1 man along and that by 1 boy alone to finish the work.

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23. The sum of a two digit number and the number obtained by reversing the order of its digits is 121, and the two digits differ by 3. Find the number.

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24. Solve the following system of equations:

$$\frac{7x-2y}{xy}=5, \quad \frac{8x+7y}{xy}=15$$

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Unit Ii Algebra Pair Of Linear Equations In Two Variables Multiple Choice Questions

1. 5 pencils and 7 pens together cost Rs 50, whereas 7 pencils and S pens together cost Rs 46. Find the cost of one pencil and that of one pen.

A. Rs 5

B. Rs 6

C. Rs 3

D. Rs 4

Answer: a

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2. The value of 'k' so that the system of equations $3x - y - 5 = 0$ and $6x - 2y - k = 0$ has infinite solutions

A. $k = -10$

B. $k = 10$

C. $k = -8$

D. $k = 8$

Answer: b

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3. Solve$px + qy = p - q, qx - py = p + q$

A. $x = -1$ and $y = 1$

B. $x = 1$ and $y = 1$

C. $x = 0$ and $y = 0$

D. $x = 1$ and $y = -1$

Answer: d

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4. A system of two linear equations in two variables is consistent , if their graphs .

A. do not intersect at any point

B. coincide

C. cut the x-axis

D. intersect only at a point or they coincide with each other .

Answer: d

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5. The value of k for which the system of equations $kx - y = 2$ and $6x - 2y = 3$ has a unique solution, is $= 3$ (b) $\neq 3$ (c) $\neq 0$ (d) $= 0$

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6. The equation $ax^n + by^n + c = 0$ represents a straight line if .

A. $n \geq 1$

B. $n \leq 1$

C. $n = 1$

D. None of these

Answer: c

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7. A pair of linear equation in two variables which has a common point i.e., which has only one solution is called a .

A. Consistent pair

B. Inconsistent pair

C. Dependent pair

D. None of these

Answer: a

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8. For which value(s) of ρ will the lines represented by the following pair of linear equations be paralle

$3x - y - 5 = 0$

$6x - 2y - p = 0$

A. all real values except 10

B. 10

C. $\frac{5}{2}$

D. $\frac{1}{2}$

Answer: a

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9. In a cricket match Kumble took three wickets less then twice the number of wickets taken by srinath . The product of the number of wickets taken by these two is 20 , then the number of wickets taken by Kumble is

A. 4

B. 5

C. 10

D. 12

Answer: b

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10. If a pair of linear equations is consistent then their graph lines will be

A. parallel

B. coincident

C. intersecting

D. either intersecting or coincident

Answer: d

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11. The lines $3x - 4y = 9$ and $y = 0$ meet at :

A. $(-3, 0)$

B. $(3, 0)$

C. $\frac{9}{4}, 0$

D. $\left(\frac{3}{2}, 0\right)$

Answer: b

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12. For what value of k , will the lines represented by the following pair of linear equation be parallel $3x + 2ky = 2$ and $2x + 5y + 1 = 0$

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Unit Ii Algebra Polynomials Very Short Answer Type Questions

1. The pair of linear equations y=0 and $y = -5$ has _____ solutions .

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2. is the following system of linear equations consistent/inconsistent ?Give reason .

$3x + 2y = 11$

$9x + 6y = 7$

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3. The value of k for which the system of equations $x + 2y - 3 = 0$ and $5x + ky + 7 = 0$ has no solution, is (a) 10 (b) 6 (c) 3 (d) 1

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4. Find the co-ordinate where the line $x - y = 8$ will intersect y-axis .

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5. In an election contested between A and B ,A obtained votes equal too twice the no. of persons on the electoral roll who did not cast their votes and this later number was equal to twice his majority over B . If there were 18000 persons on the electoral roll . How many voted for B .

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6. Solve for x and y : $41x + 53y = 135, 53x + 41y = 147$.

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7. At a certain time in a deer park , the number of heads and the number of legs of deer and human visitors were counted and it was found there were 39 heads and 132 legs .

Find the number of deer and human visitors in the park .

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8. Solve $2x + 3y = 11$ and $x - 2y = -12$ algebraically and hence find the value of m for which $y = mx + 3$.

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9. Find the values of a and b for which the following system of equations has infinitely many solutions :

$2x + 3y = 7$

$2ax + ay = 28 - by$

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10. Write the nature of the equations

$6x - 2y + 9 = 0$ and $3x - y + 12 = 0$

A. coincident

B. parallel

C. intersecting exactly at one point

D. perpendicular to each other

Answer: B

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11. Write the equation of a line which is parallel to the line whose equation is $5x + 3y + 11 = 0$

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12. For what value of k will the equations $4x + 5y = 12$ and $kx + 10y = 48$ represent intersecting lines ?

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13. For what value of 'k' will the following system of equations have infinitely many solutions ?

$3x + 2y = 1, (2k + 1)x + (k + 2)y = k - 1$

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14. Find the value of k , for which the system of equation $x - ky = 2$ and $3x + 6y = 6$, has infinitely many solutions .

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Unit Ii Algebra Quadratic Equations Multiple Choice Questions

1. For equal root , $x^2 - 6x + k$ value of k is

A. 9

B. 3

C. 2

D. 8

Answer: A

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2. The quadratic equation whose roots are 3 and -3 is .

A. $x^2 - 9 = 0$

B. $x^2 - 3x - 3 = 0$

C. $x^2 - 2x + 2 = 0$

D. $x^2 + 9 = 0$

Answer: A

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3. Which of the following have real root .

A. $2x^2 + x + 1 = 0$

B. $x^2 + x + 1 = 0$

C. $x^2 - 6x + 6 = 0$

D. $2x^2 + 15x + 30 = 0$

Answer: C

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4. Which of the following is quadratic equation ?

A. $x^3 - 2x^2 - \sqrt{5} - x = 0$

B. $3x^2 - 5x + 9 = x^2 - 7x + 3$

C. $\left(\frac{x+1}{x}\right)^2 = 3\left(\frac{x+1}{x+4}\right)$

D. $x^3 + x + 36$

Answer: B

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5. If the equation $\left(a^2+b^2\right)x^2-2(ac+ba)x+\left(c^2+d^2\right)=0$ has equal roots, then which one of the following is correct?

A. $ad=bc$

B. $ab=cd$

C. $ad=\sqrt{bc}$

D. $ab=\sqrt{cd}$

Answer: A

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6. $(x+1)^2+x^2=0$ has

A. no real roots

B. one real root

C. two real root

D. four real root

Answer: A

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7. The equation $k^2x^2 + kx + 1 = 0$ has

A. one real root

B. two real roots

C. no real roots

D. None of these

Answer: C

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8. If the equation $x^2 - bx + 1 = 0$ does not possess real roots, then which one of the following is correct?

A. $-3 < b < 3$

B. $-2 < b < 2$

C. $b < -2$

D.

Answer: B

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9. Four steps to derive the quadratic formula are shown below .

(I) $x^2 + \frac{bx}{a} = \frac{-c}{a}$

(II) $\left(x + \frac{b}{2a}\right)^2 = \frac{b^2 - 4ac}{4a^2}$

(III) $x = \pm\sqrt{\frac{b^2 - 4ac}{4a^2}} - \frac{b}{2a}$

(IV) $x^2 + \frac{bx}{a} + \left(\frac{b}{2a}\right)^2 = \frac{-c}{a} + \left(\frac{b}{2a}\right)^2$

What is the correct order for these steps ?

A. I,II,III,Iv

B. IV,II,I,III

C. I,Iv,II,III

D. I,III,II,IV

Answer: C

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10. Which of the following equations has 2 as a root?

A. $2x^2 - 7x + 6 = 0$

B. $3x^2 - 6x + 3 = 0$

C. $x^2 - 4x + 5 = 0$

D. $x^2 + 3x - 12 = 0$

Answer: A

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Unit Ii Algebra Quadratic Equations Very Short Answer Type Questions

1. Solve the following quadratic equations :

(i) $x^2 - 45x + 324 = 0$ (ii) $x^2 - 55x + 750 = 0$

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2. Solve the following quadratic equations :

(i) $x^2 - 45x + 324 = 0$ (ii) $x^2 - 55x + 750 = 0$

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3. Find the nature of roots of the given quadratic equation : $2x^2 - 6x + 3 = 0$

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4. Is $(x + 2)^2 = 2x(x - 2)$, a quadratic equation ?

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5. Find the value of k , for which one root of the quadratic equation $kx^2 - 14x + 8 = 0$ is 6 times the other .

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Unit Ii Algebra Quadratic Equations Short Answer Type Questions

1. $\frac{1}{(p+q+x)} = \frac{1}{p} + \frac{1}{q} + \frac{1}{x}$ solve for by factorization method .

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2. $If -4$ is a root of the quadratic equation $x^2 + px - 4 = 0$ and the quadratic equation $x^2 + px + k = 0$ has equal roots, find the value of k.

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3. Find the roots of the following Quadratic Equations by factrorization .

$x^2 - 3x - 10 = 0$

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4. Find the roots of the following Quadratic Equations by factrorization .

$2x^2 + x - 6 = 0$

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5. Find the roots of following quadratic equation by factorisation:

$\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$

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6. Find the roots of the following quadratic equations by factorisation:

(i) $\sqrt{2}x^2 + 7x + 5\sqrt{2} = 0$ (ii) $2x^2 - x + \frac{1}{8} = 0$

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7. Find the roots of the following Quadratic Equations by factrorization .

$100x^2 - 20x + 1 = 0$

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8. Value of x for $x^2 - 8x + 15 = 0$ is

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9. If -5 is a root of the quadratic equation $2x^2 + px - 15 = 0$ and the quadratic equation $p(x^2 + x) + k = 0$ has equal roots, find the value of k.

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10. If $x = \frac{2}{3}$ and $x = -3$ are the roots of the quadratic equation $ax^2 + 7x + b = 0$ then find the values of a and b.

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11. Simplify and find the value of $x : \frac{1}{(x-1)(x-2)} + \frac{1}{(x-2)(x-3)} = \frac{2}{3}, x \neq 1, 2, 3$

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12. If roots of equation $a-b)x^2 + (b-c)x + (c-a) = 0$ are equal then prove that $b + c = 2a$

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13. Using the quadratic formula ,solve the quadratic equation : $x - \frac{31}{x} = 0$

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14. Find the roots :

$\frac{x-3}{x+3} - \frac{x+3}{x-3} = 0, (x \neq 3, -3)$

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15. If p and q are the root of the equation $x^2 - px + q = 0$, then what are the vlaues of p and q respectively ?

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16. Determine the value of k for which the quadratic equation $4x^2 - 3kx + 1 = 0$ has equal roots :

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Unit Ii Algebra Quadratic Equations Long Answer Type Questions

1. Solve for x: $9x^2 - 9(a+b)x + \left(2a^2 + 5ab + 2b^2\right) = 0$

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2. Solve: $\frac{1}{a+b+x} = \frac{1}{a} + \frac{1}{b} + \frac{1}{x}$

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Unit Ii Algebra Arithmetic Progressions Multiple Choice Questions

1. The n^{th} term of the AP in 2,5,8 .... Is

A. $3n - 1$

B. $2n - 1$

C. $3n - 2$

D. $2n - 3$

Answer: A

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2. The 17^{th} term of an AP exceeds its 10^{th} term by 7. Find the common difference.

A. 2

B. -1

C. 3

D. 1

Answer: D

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3. Find the 10^{th} term of the AP : 2, 7, 12, . . .

A. 45

B. 47

C. 48

D. 50

Answer: B

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4. If the perimeter of a circle is equal to that of a square, then the ratio of their areas is

A. $22:7$

B. $14:3$

C. $14:11$

D. $11:21$

Answer: C

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5. If the 10^{th} term of an AP is 0 , then find the ratio of the 27^{th} term and the 15^{th} term of the AP.

A. $1:1$

B. $17:5$

C. $1:3$

D. $3:1$

Answer: B

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6. Write the next term : $\sqrt{12}, \sqrt{27}, \sqrt{48}, \sqrt{75}. \ldots.$

A. $\sqrt{99}$

B. $\sqrt{96}$

C. $\sqrt{108}$

D. $\sqrt{114}$

Answer: C

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7. If $2x+1, x^2+x+1$ and $3x^2-3x+3$ are in $A.P$,then the value of x :

A. 1

B. 2

C. 1,2

D. $-1, \ -2$

Answer: C

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8. Which term of the sequence $-1, 3, 7, 11, 95$?

A. 25^{th}term

B. 24^{th}term

C. 23^{rd}term

D. 22^{nd} term

Answer: A

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9. If a, b, c, d, e, f are in AP, then $(e - c)$ is equal to which one of the following?

A. $2(c - a)$

B. $2(f - d)$

C. $2(d - c)$

D. $d - c$

Answer: C

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Unit Ii Algebra Arithmetic Progressions Very Short Answer Type Questions

1. Find the first term and the common difference $\frac{1}{3}, \frac{5}{3}, \frac{9}{3}, \frac{13}{3} \ldots\ldots$

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2. Which term of the AP : 121, 117, 113, . . ., is its first negative term?

[Hint : Find n for $a_n < 0$]

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3. Cheack whether -150 is a term of the A.P. 11, 8, 5, 2,.....

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4. Which term of the AP : 3, 8, 13, 18, . . . , is 78?

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5. The common difference the terms of two AP's is same . If the difference between their 100th terms ?

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6. Is $2, 4, 8, 16. \ldots \ldots$ an arithmetic progression ?

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7. Can 35 be a term of the sequence $-34, -30, -26, \ldots \ldots \ldots$?

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8. What is the common difference of an AP in which $a_{18} - a_{14} = 32$?

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Unit Ii Algebra Arithmetic Progressions Short Answer Type Questions

1. For what value of n are the nth terms of the following two Aps the same $13, 19, 25, \ldots$ and $69, 68, 67, \ldots$? Also, find this term.

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2. How many three digit numbers are divisible by 7?

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3. Two APs have the same common difference. The difference between their 100^{th}terms is 100, what is the difference between their 1000^{th}terms?

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4. If the ratio of the sums of m and n terms of A.P. is $m^2 : n^2$, then the ratio of its m^{th} and n^{th} terms is given by

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5. If the 4th term of an A.P. is zero, prove that the 25th term of the A.P. is three times its 11th term.

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6. How many terms of the AP 27, 24, 21 .....should be taken so that their sum is zero.

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7. How many terms of the sequence $18,\ 16,\ 14,\ \cdot$ should be taken so that their sum is zero?

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8. Find the 9th term from the ctowards the first term of the A.P. 5,9,13,....,185

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9. If the 7^{th} and 10^{th} term of an AP are 18 and -6 respectively , which term of the AP is zero ?

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10. Find the first negative term of the sequence $185, 181, 177, 173, \ldots\ldots$

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11. The sum of the first n terms of an AP is given by $S_n = n^2 + 5n$ .find the sixteenth term of the AP.

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12. Two AP's have the same common difference . The first term of the AP's are 39 and 58 respectively . What is the difference between their 16^{th} terms ?

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13. If m times the m^{th} term of an A.P. is equal to n times its n^{th} term , then show that $(m+n)^{th}$ term of the A.P. is zero .

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14. The houses of a row are numbered from 1 to 49. Show that there is a value of x such that the sum of the numbers of the houses preceding the house numbered x is equal to the sum

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Unit Ii Algebra Arithmetic Progressions Long Answer Type Questions

1. If the sum of n terms of an A.P. is $3n^2 + 5n$ and its mth term is 164, find the value of m.

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2. Which term of the sequence $20, 19\frac{1}{4}, 18\frac{1}{2}, 17\frac{3}{4}, \cdot$ is the first negative term?

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3. Divide 56 in four parts in A.P. such that the ratio of the product of their extremes (1st and 4th) to the product of means (2nd and 3rd) is 5:6.

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4. The sums of n terms of three arithmetical progressions are $S_1, S_2 and S_3 \cdot$ The first term of each unityand the common differences are $1, 2 and 3$ respectively. Prove that $S_1 + S_3 = 2S_2 \cdot$

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5. The digits of a positive integer, having three digits, are in A.P. and their sum is 15. The number obtained by reversing the digits is 594 less than the original number. Find the number.

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6. The ratio of the sum of n terms of two A.Ps is $(7n + 1) : (4n + 27) \cdot$ Find the ratio of their m^{th} terms.

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7. If the sum of first 7 terms of an A.P. is 49 and that of its 17 terms is 289, find the sum of first n terms of the A.P.

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8. The sum of the first 9 terms of an AP is 81 and that of its first 20 terms is 400. Find the first term and the common difference of the AP

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9. The sum of four consecutive numbers in A.P. is 32 and the ratio of the product of the first and last term to the product of two middle terms is 7:15. Find the numbers.

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10. If the sum of m terms of an AP is the same as the sum of its n terms , show that the sum of its $(m+n)$ terms is zero .

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11. How many terms of the AP : 24, 21,18,... must be taken so that their sum is 78?

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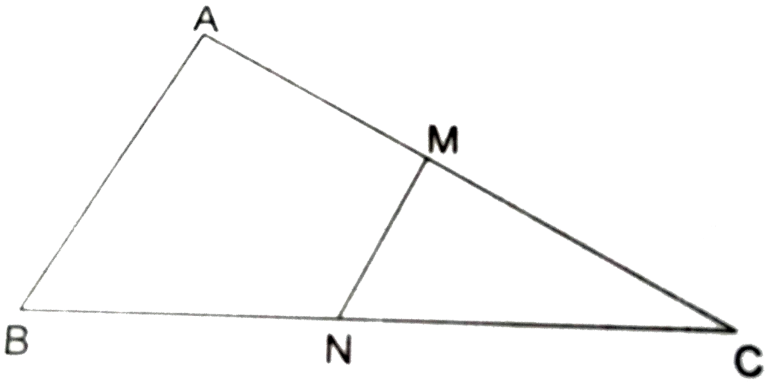
Unit Iii Coordinate Geometry Coordinate Geometry Multiple Choice Questions

1. In the given figure, $MN \| \| AB, BC = 7.5cm, AM = 4cm$ and $MC = 2cm.$ Find

the length of BN.



A. 6 cm

B. 7 cm

C. 5 cm

D. 4 cm

Answer: C

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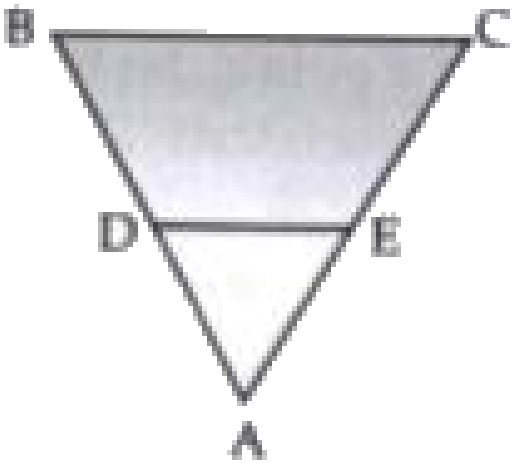
2. In figure ,$DE||BC$ in triangle ABC such that BC = 8 cm , AB = 6 cm and DA = 1.5 cm .find DE.



A. 2 cm

B. 3 cm

C. 4 cm

D. 5 cm

Answer: A

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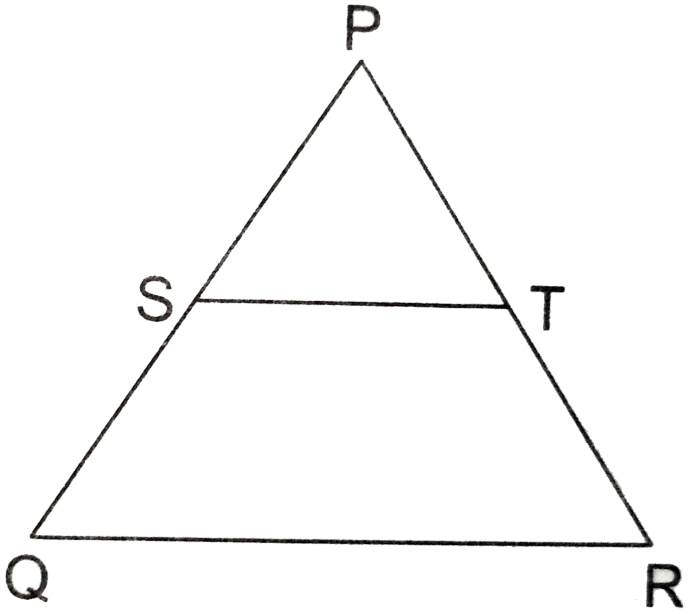
3. In the adjoining figure, S and T are points on the sides PQ and PR respectively of ΔPQR such that $PT = 2cm, TR = 4cm$ and ST is parallel to QR. Find the ratio of the ares ofΔPST and ΔPQR.



A. $\frac{1}{9}$

B. $\frac{2}{9}$

C. $\frac{3}{9}$

D. $\frac{4}{9}$

Answer: A

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4. If $\Delta ABC \sim \Delta PQR$ with $\frac{BC}{QR} = \frac{1}{3}$,then $\frac{ar(\Delta PRQ)}{ar(\Delta BCA)}$ is equal to

A. 9

B. 3

C. $\frac{1}{3}$

D. $\frac{1}{9}$

Answer: A

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5. The shadow of a 5-m-long stick is 2m long. At the same time, the length of the shadow of a $12.5m$ high tree is

A. $6.3cm$

B. $5.4cm$

C. $7.2cm$

D. 5 cm

Answer: D

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Unit Iii Coordinate Geometry Coordinate Geometry Very Short Answer Type Questions

1. If $\Delta ABC \sim \Delta RPQ$,AB = 3 cm ,BC = 5 cm , AC = 6 cm , RP = 6 cm and PQ = 10 cm , then find QR.

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2. Let $\Delta ABC - \Delta DEF, ar(\Delta ABC) = 169cm^2$ and $ar(\Delta DEF) = 121cm^2$. If AB = 26 cm thhen find DE.

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3. In ΔDEW, $AB||EW$. If AD = 4 cm , DE = 12 cm and DW = 24 cm , then find the value of DB .

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4. ΔABC~ΔDEF such that DE = 3 cm , EF = 2 cm , DF = 2.5 and BC = 4 cm . Find the perimeter of ΔABC.

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5. If triangle ABC is similar to triangle PQR , Perimeter of triangle ABC = 30 cm , Perimeter of triangle = 45 cm , PR = 9 cm then find AC.

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6. The areas of two similar triangles ABC and DEF are $144cm^2$ and $81cm^2$ respectively . If the longest side of the larger triangle is 36 cm , find the longest side of the other triangle .

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7. In triangle ABC, $DE \| BC$ and $\frac{AD}{DB} = \frac{3}{(5)}$. If AC = 4.8 cm .Find AE.

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8. P and Q are the points on the sides DE and DF of a triangle DEF such that DP = 5 cm, DE = 15 cm, DQ = 6 cm and QF = 18 cm. Is PQ||EF? Give reasons for your answer

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9. ΔABC, is right angles at C. If p is thhe length of the perpendicular from C to AB and a,b,c are the lengths of the sides opposites $\angle A$, $\angle B$, $\angle C$respectively then prove that

$$\frac{1}{p^2} = \frac{1}{a^2} + \frac{1}{b^2}$$

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10. From airport two aeroplanes start at the same time . If the speed of first aeroplane due North is 500 km/h and that of other due East is 650 km/h , then find the distance between two aeroplanes after 2 hours .

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11. R and s are points on the sides DE and EF respectively of a ΔDEF such that ER = 5 cm , RD = 2.5 cm , SE = 1.5 cm and FS = 3.5 cm .Find whether $RS||DF$ or not .

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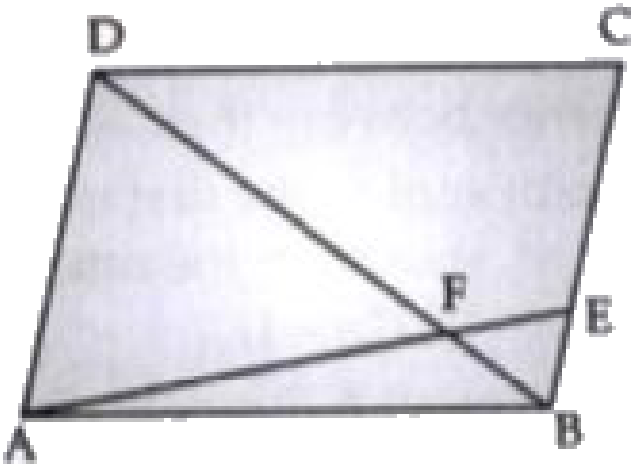
12. In the figure ,ABCD is a parallelogram and E divides BC in the ratio $1:3$ DB and AE intersect at F. Show that DF = 4FB and AF = 4FE .



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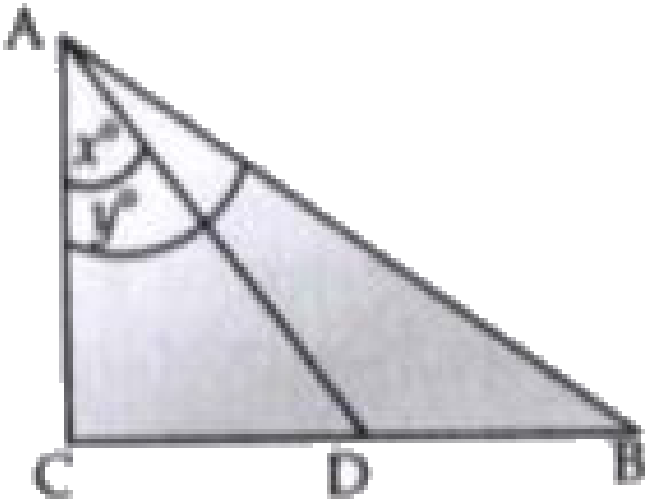
13. In fig , if D is mid point of BC , find the value of $\frac{\tan x^{\circ}}{\tan y^{\circ}}$



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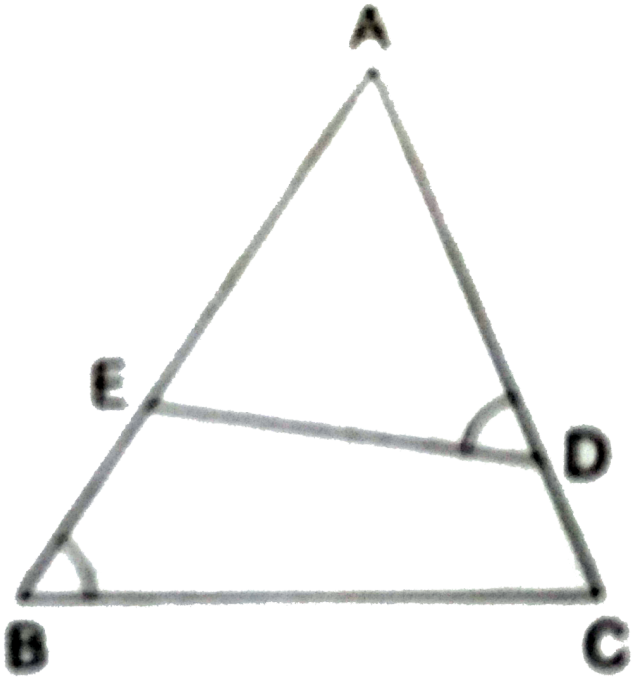
Unit Iii Coordinate Geometry Coordinate Geometry Long Answer Type Questions

1. In the given figure, if $\angle ADE = \angle B$, show that $\Delta ADE \sim \Delta ABC$. If $AD = 3.8cm$, $AE = 3.6cm$, $BE = 2.1cm$, and $BC = 4.2cm$, find DE.



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2. State and prove Converse of Pythagoras Theorem .

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3. Theorem 6.1 : If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.

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4. In $\Delta ABC, AX \perp BC$ and Y is middle point of BC. Then prove that ,

$$AB^2 = AY^2 + \frac{BC^2}{4} - BC.XY$$

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5. In $\Delta ABC, AX \perp BC$ and Y is middle point of BC. Then prove that ,

$$AC^2 = AY^2 + \frac{BC^2}{4} + BC.XY$$

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6. O is any point inside a rectangle ABCD. Prove that $OB^2 + OD^2 = OA^2 + OC^2$.

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7. In Figure the line segment XY is parallel to side AC of ΔABC and it divides the triangle into two parts of equal areas. Find the ratio $\frac{AX}{AB}$.

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8. If AD and PM are medians of triangles ABC and PQR, respectively where $\Delta ABC \Delta PQR$, prove that $\frac{AB}{PQ} = \frac{AD}{PM}$

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9. The perpendicular drawn from A on sides BC of a ΔABC intersects BC at D such that DB = 3CD .Prove that $2AB^2 = 2AC^2 + BC^2$.

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10. In ΔABC, D, E, F are respectively the mid points of the sides AB, BC and AC. Find ratio of the area of ΔDEF and area of ΔABC.

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11. Prove that the area of an equilateral triangle described on one side of a square is equal to half the area of the equilateral triangle described on one of its diagonals.

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Unit Iv Geometry Triangles Multiple Choice Questions

1. The centroid of a triangle formed by $(2, p), (q, 7), (3, 1) is (6, 3)$ .then $p + q$ is

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2. The two vertices of a triangle are $(7, 13)$ and $(-4, 2)$ and it's centroid is $(3, 1)$, then the third vertex is

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3. If the origin is the midpoint of the line segment joined by the points (-12,13) and (x,y) , then (x,y) is

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4. The distance of the point $P(2, 3)$ from the X-axis is

A. 2

B. 3

C. 1

D. 4

Answer: B

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5. If the distance of P(x,y) from A(2,4) and B$(-3, 1)$ are equal , then relation between x and y is.

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6. Find the co-ordinates of a point which divide the segment AB in ratio $1:4$ internally , where A $(7, -8)$ and $B(-4, 3)$.

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7. The coordinates of a point A such that $(3, -7)$ bisects the line AB internally, where B(2,5) is :

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8. The point which lies on the perpendicular bisector of the line segment joining the points A(-2,-5) and B (2,5) is

A. $(0, 0)$

B. $(0, 2)$

C. $(2, 0)$

D. $(-2, 0)$

Answer: A

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Unit Iv Geometry Triangles Very Short Answer Type Questions

1. Prove that the points (3, 0), (6, 4) and (-1, 3) are the vertices of a right angled isosceles triangle.

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2. The x-coordinate of a point P is twice its y-coordinate. If P equisdtant from $Q(2, -5)$ and $R(3, 6)$ find the coordinates of P .

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3. Find the ratio in which y-axis divides the line segment joining the points $A(5, -6)$ and $B(-1, -4)$ and find the point .

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4. Find the coordinates of a point A , here AB is a diameter of the circle whose centre is $(2, -3)$ and $B(1, 4)$.

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5. Find the distance between $(a \sin 70^\circ, -a \sin 20^\circ)$ and $(-a \sin 70^\circ, a \sin 20^\circ)$.

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6. If $P\left(\frac{a}{2}, 4\right)$ is the mid-point of the line-segment joining the points $A(-6, 5)$ and $B(-2, 3)$, then the value of a is

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7. If the point $C(3, 7)$ divides internally the line segment joining the points $A(4, 8)$ and $B(a, b)$ in the ratio $1:3$, find the value of $|a^2 - b^2|$.

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8. If the point (x, y) is equidistant from the points $(a_b, b-a)$ and $(a-b, a+b)$, prove that $bx = ay$.

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9. Prove that the points (2,-2), (-2, 1) and (5, 2) are the vertices of a right angled triangle. Also find the area of this triangle.

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10. Find the ratio in which the point $(-3, p)$ divides the line segment joining the points $(-5, -4)$ and $(-2, 3)$. Hence, find the value of p.

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11. . Let P and Q be the points of trisection of the line segment joining the points A(2, -2) and B(-7, 4) such that P is nearer to A. Find the coordinates of P and Q.

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12. Find the coordinates of the points which divide the line segment joining $A(2, \ 2) \ and \ B(2, 8)$ into four equal parts.

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13. In what ratio does the y-axis divide the line segment joining the point $P(-4, 5)$ and $Q(3, -7)$? Also, find the coordinates of the point of intersection.

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14. If the points $(-2, -1), (1, 0), (x, 3)$ and $(1, y)$ form a parallelogram, find the values of x and y .

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15. Find a relation between x and y such that the point (x ,y) is equidistant from the points (7, 1) and (3, 5).

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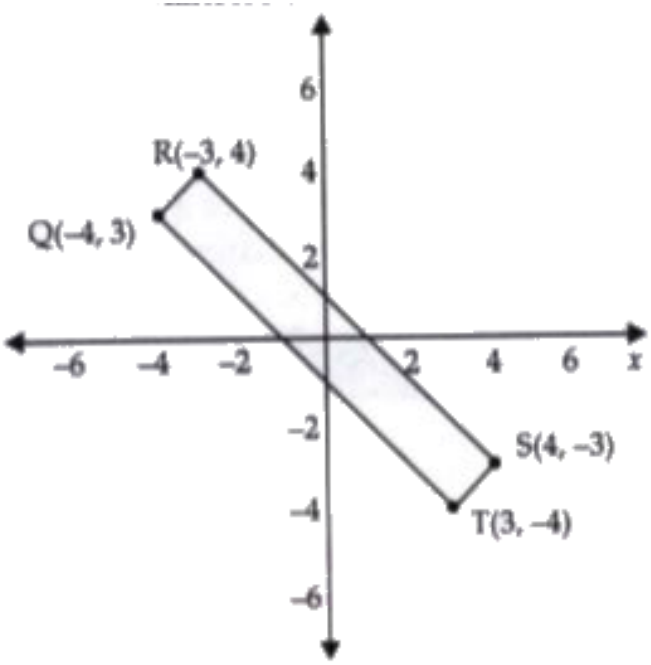

16.

The figure shows layout of a park . Find the length of wire required to fence the park ?

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17. In what ratio does the line $2x + y - 4$ divides the join of $P(2, -2)$ and $Q(3, 7)$?

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Unit Iv Geometry Triangles Long Answer Type Questions

1. Show that the points $(-2, 5), (3, -4)$ and $(7, 10)$ are the vertices of the right angled triangle .

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2. Determine the ratio in which the line $3x + y = 9$ divides the line segment joining the points $(1, 3)$ and $(2, 7)$

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3. Find the coordinates of the point R on the line segment joining the points P$(-1, 3)$ and Q $(2, 5)$ such that PR $= \frac{3}{5}$ PQ.

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4. Find the ratio in which the line $2x + 3y - 5 = 0$ divides the line segment joining the points (8,-9) and (2,1). Also find the coordinates of the points of division.

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Unit Iv Geometry Circles Multiple Choice Questions

1. How many tangents can be drawn froman external point to a circle

.

A. 1

B. 2

C. 3

D. 4

Answer: B

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2. If the angle between two radii of a circle is 130° then the angle between the tangents at the ends of the radii is

A. 90

B. 50

C. 70

D. 40

Answer: B

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3. A point P is 13 xm from the centre of a circle . Radius of the circle is 5 cm . A tangent is drawn from point P to the circle , then the length of the tangent is :

A. 10

B. 11

C. 12

D. 13

Answer: C

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4. A tangent PQ at point P of a circle of radius 12 cm meets a line through the centre O to a point Q so that OQ = 20 cm . Length PQ is :

A. 14

B. 15

C. 16

D. 10

Answer: C

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5. Which of the following pairs of lines in a circle cannot be parallel?

A. Two chords

B. A chord and a tangent

C. Two tangents

D. Two diameters

Answer: D

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6. If PA and PB are two tangents to a circle with centre O such that $\angle APB = 80^\circ$, then, $\angle AOP = ?$

A. 40

B. 50°

C. 60°

D. 70°

Answer: B

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7. The lengths of three consecutive sides of a quadrilateral circumscribing a circle are 4 cm, 5cm, and 7cm respectively. Determine the length of the fourth side.

A. 7 cm

B. 6 cm

C. 8 cm

D. 9 cm

Answer: B

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8. AB and CD are two common tangents to circles which touch each other at C . If D lies on AB such that CD =4cm, then AB is equal to (a) 4cm (b) 6cm (c) 8cm (d) 12cm

A. 4 cm

B. 6 cm

C. 8 cm

D. 12 cm

Answer: B

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9. Prove that the parallelogram circumscribing a circle is a rhombus.

A. Rhombus

B. Square

C. Rectangle

D. Trapezium

Answer: C

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10. Find the distance between two parallel tangents of a circle whose radius is 3.5 cm .

A. 7 cm

B. $3.5cm$

C. 10 cm

D. cannot be determined

Answer: A

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11. In Figure 2, AB and AC are tangents to the circle with centre O such that angle BAC = 40°. Then angle BOC is equal to

A. 100°

B. 140°

C. 50°

D. 70°

Answer: A

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12. Two circles of diameters 10 cm and 6 cm have the same centre. A chord of the larger circle is a tangent of the smaller one. The length of the chord is

A. 8 cm

B. 16 cm

C. 20 cm

D. 10 cm

Answer: D

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13. The length of tangent drawn to a circle with radius 7 cm from a point 25 cm away the centre , is

A. 24 cm

B. 27 cm

C. 26 cm

D. 25 cm

Answer: B

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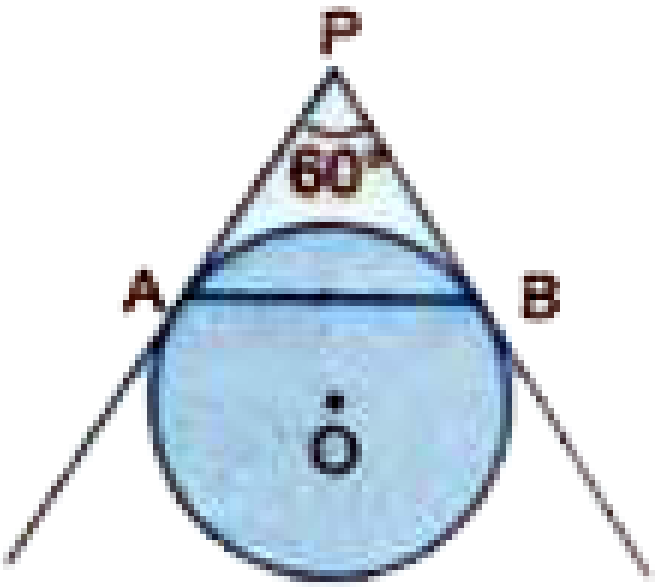
Unit Iv Geometry Circles Very Short Answer Type Questions

1. In Fig AP and BP are tangents to a circle with centre O, such that AP = 5 cm , and $\angle APB = 60^\circ$. Find the length of chord AB.



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2. In Fig. 10.21, two circles touch each other at the point C . Prove that the common tangent to the circles at C , bisects the common tangent at P and Q . (FIGURE)

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3. A tangent PQ at a point P of a circle of radius $5cm$ meets a line through the centre O at a point Q so that $OQ = 13cm$. Find the length of PQ.

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4. Two concentric circles of radii a and $b(a > b)$ are given. Find the length of the chord of the larger circle which touches the smaller circle.

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5. In two concentric circles, a chord of length 24cm of larger circle becomes a tangent to the smaller circle whose radius is 5cm. Find the radius of the larger circle.

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6. If ABC is isosceles with $AB = AC$ and $C(O,\ r)$ is the incircle of the ABC touching BC at L, prove that L bisects BC.

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Unit Iv Geometry Circles Short Answer Type Questions

1. In Fig.2, a quadrilateral ABCD is drawn to circumscribe a circle, with centre O, in such a way that the sides AB, BC, CD and DA touch the circle at the points P, Q, R and S respectively. Prove that AB + CD = BC + DA.

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2. In the given figure, a circle inscribed in a triangle ABC touches the sides AB, BC and CA at points D, E and F respectively. If AB = 14 cm, BC

= 8 cm and CA = 12 cm. Find the lengths AD, BE and CF.

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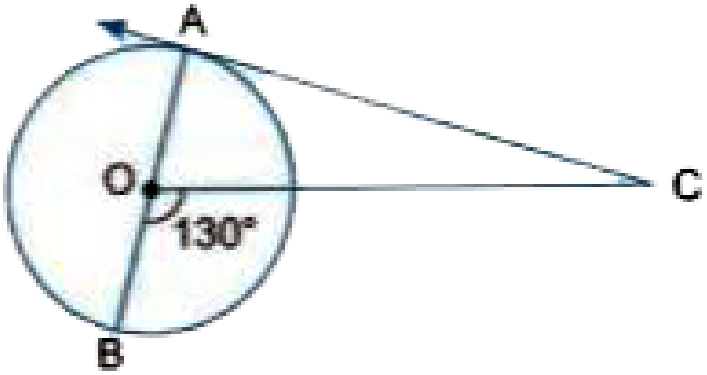
3. If Fig , AOB is diameter of a circle with centre O and AC is a tangent to the circle at A . If $\angle BOC = 130^\circ$, then find $\angle ACO$.



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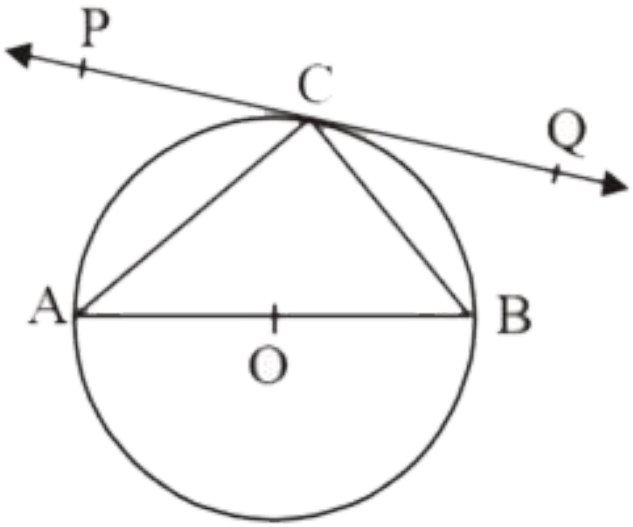
4. In figure PQ is a tangent at a point C to a circle with centre O. If AB is a diameter and $\angle CAB = 30^\circ$, find $\angle PCA$



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5. From the external point P tangents PA and PB are drawn to a circle with centre O. If $\angle PAB = 50^\circ$, then find $\angle AOB$.

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6. From an external point P, two tangents PT and PS are drawn to a circle with centre O and radius r. if OP=2r, show that $\angle OTS = \angle OST = 30^\circ$

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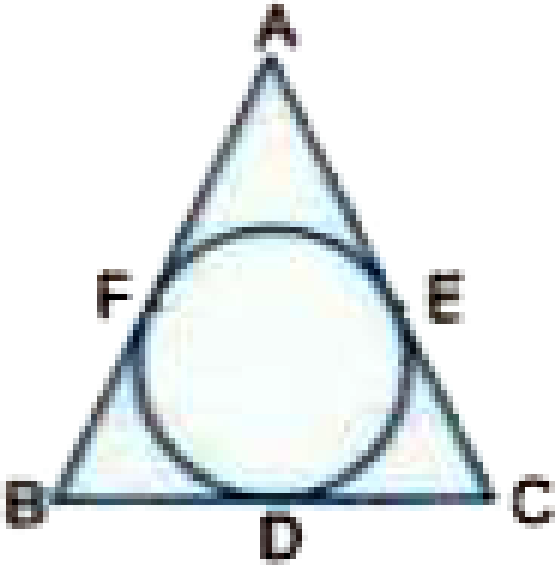
7. The incircle of an isosceles triangle ABC, in which AB = AC, touches the sides BC, CA and AB at D, E and F respectively . Prove that BD = DC.



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8. Prove that the tangent at any point of circle is perpendicular to the radius through the point of contact.

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9. A circle is inscribed in the quadrilateral ABCD. Given BC= 38 cm . BQ= 27 cm , CD = 25 cm and $\angle ADC = 90^\circ$ find the radius of the circle .

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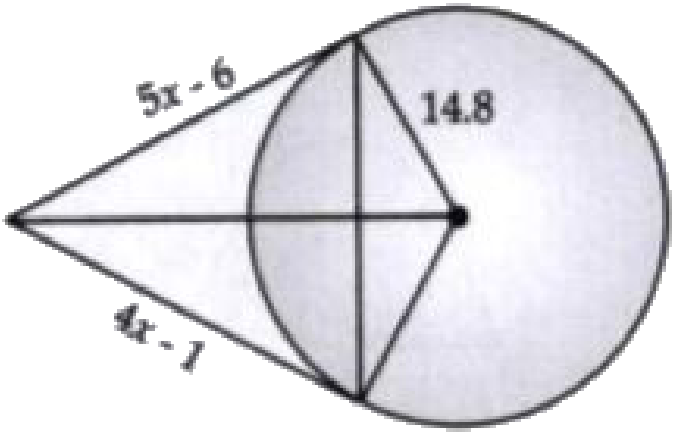
10. Find the value of x.



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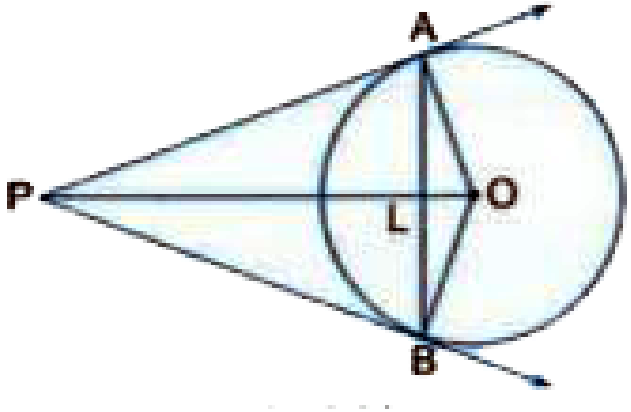
11. In Fig , AB is a chord of a circle , with centre O , such that AB = 16 cm and radius of circle is 10 cm. Tangents at A and B intersect each

other at P . Find the length of PA.



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12. Prove that the length of the tangents drawn from an external point to a circle are equal.

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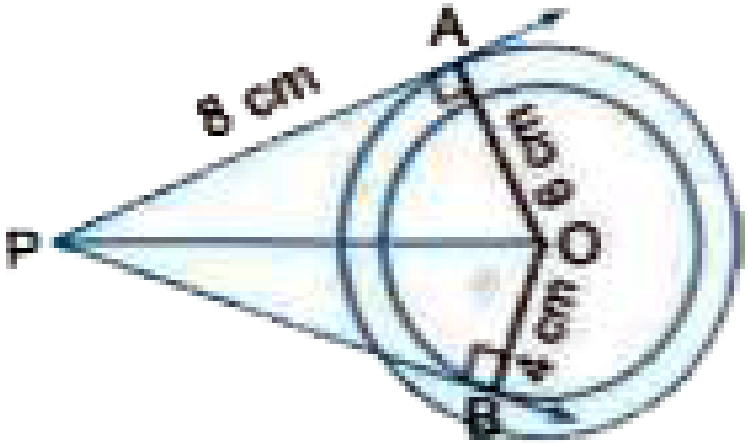
13. In Fig , are two concentric circles of radii 6 cm and 4 cm with centre O . If AP is a tangent to the larger circle and BP to the smaller

circle and length of AP is 8 cm, find the length of BP.



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14. From a point P, two tangents PT and PS are drawn to a circle with center O.Such that $\angle SPT = 120^\circ$. Prove that OP=2PS.

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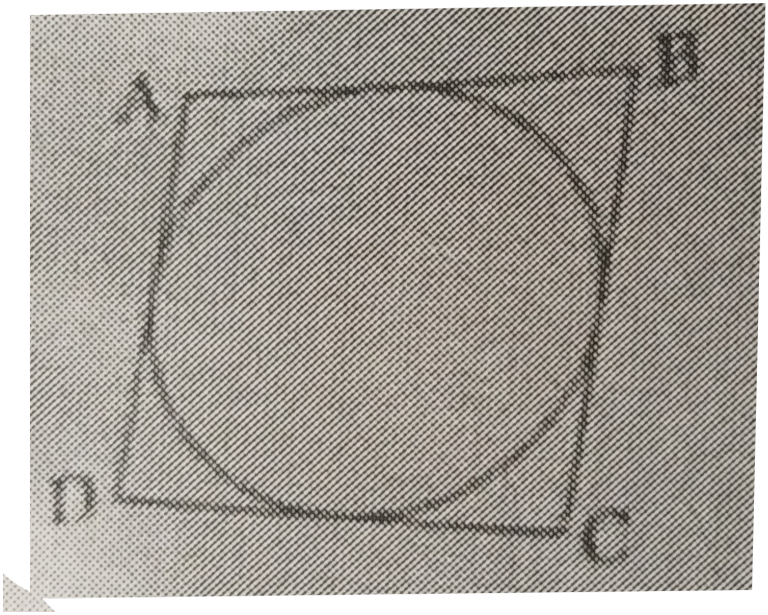
15. In Figure, a quadrilateral ABCD is drawn to circumscribe a circle . Prove that

$AB + CD = BC + AD$



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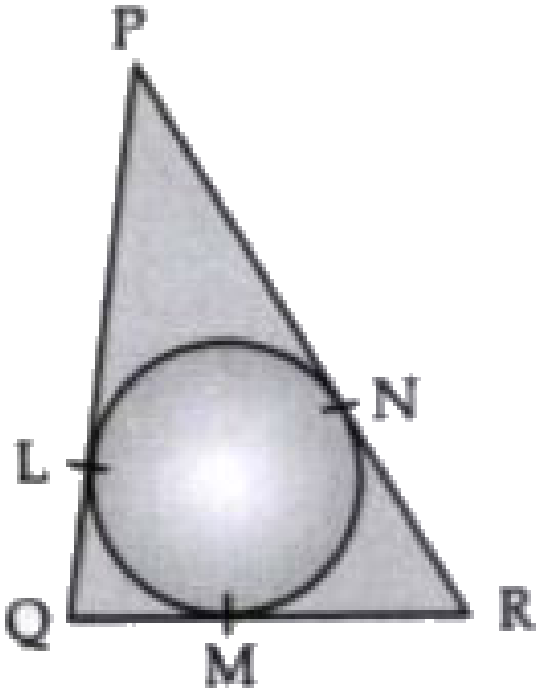
16. In fig , a circle isinscribed in a triangle PQR with PQ = 10 cm , QR = 8 cm and PR = 12 cm .Find the length of the QM , RN and PL.



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17. In the given figure the sides AB, BE and CA of triangle ABC touch a circle with centre O and radius r at P,Q and R respectively.

Prove that : $(i) AB + CQ = AC + BQ$

(ii) Area $(\triangle ABC) = \frac{1}{2}(\text{Perimeter of } \triangle ABC) \times r$

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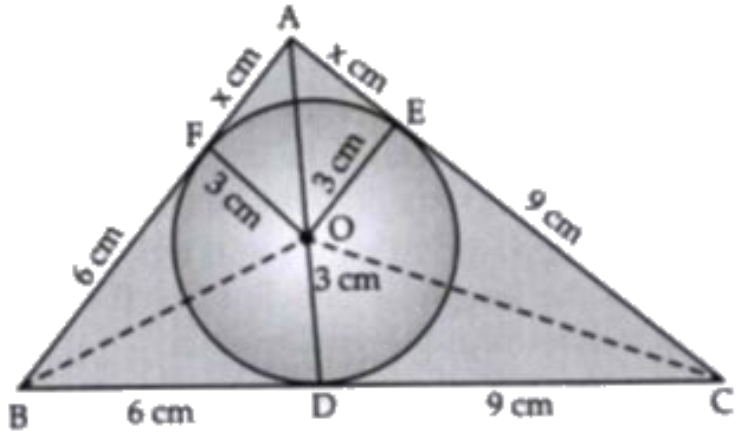
18. In figure , a triangle ABC is drawn to circumscribe a circle of radius 3 cm , such that segments BD and DC are of length 6 cm and 9 cm .If the area of $\triangle ABC = 54cm^2$, then find the lengths of the side AB and AC.



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19. A triangle ABC is drawn to circumscribe a circle of radius 4 cm such that the segments BD and DC into which BC is divided by the point of

contact D are of lengths 8 cm and 6 cm respectively. Find the sides AB and AC.

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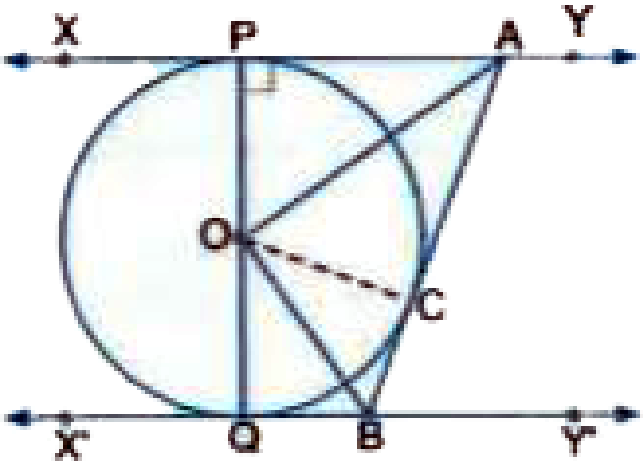
20. In Fig XY and X'Y' are two parallel tangents to a circle with centre O and another tangent AB with point of contact C intersecting XY and X'Y' at B , prove that $\angle AOB = 90^\circ$



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21. Two tangents TP and TQ are drawn to a circle with centre O from an external point T. Prove that $\angle PTQ = 2\angle OPQ$.

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22. A circle touches the side BC of ΔABC at P and touches AB and AC produced at Q and R respectively. Prove that AQ=1/2(Perimeter of ΔABC).

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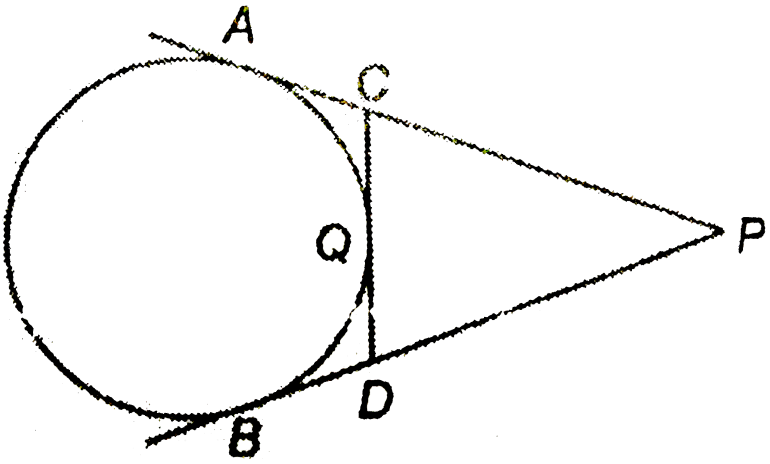
Unit Iv Geometry Constructions Very Short Answer Type Questions

1. In the given figure PA and PB are tangents to the circle drawn from an external point P. CD is a third tangent touching the circle at Q. If

PB=10cm and CQ=2cm. What is the length of PC?



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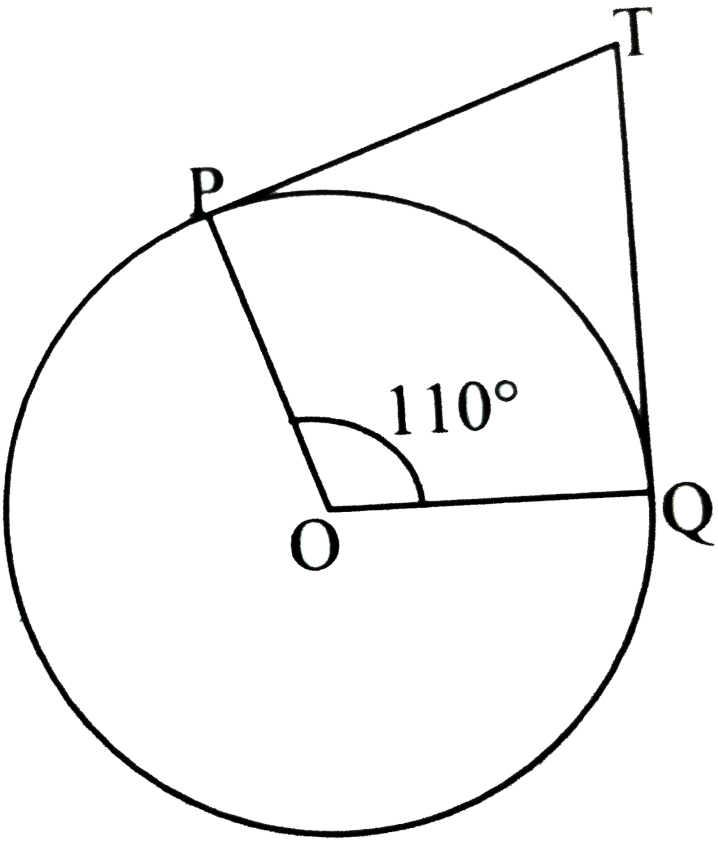
2. In the given figure , if TP and TQ are the two tangents to a circle with centre O so that $\angle POQ = 110^\circ$, then $\angle PTQ$ is equal to



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Unit Iv Geometry Constructions Long Answer Type Questions

1. Draw two concentric circles of radii 3 cm and 5 cm . Construct a tangent to smaller circle from a point on the larger circle . Also

measure its length.

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2. Let ABC be a right triangle in which AB = 6 cm, BC = 8 cm and $\angle B = 90^\circ$. BD is the= perpendicular from B on AC. The circle through B, C, D is drawn. Construct the tangents from A to this circle.

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3. Draw a circle of radius 4.8 cm .Take a point P on it . Without using the centre of the circle , construct a tangent at the point P. Write the steps of construction .

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4. Draw a circle of radius 4 cm . Draw a tangent to the circle , making an angle of 60° with a line passing through the centre .

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5. Construct a tangent to a circle of radius 4 cm from a point on the concentric circle of radius 6 cm and measure its length. Also verify the measurement by actual calculation

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6. Draw a circle of radius 3 cm . Draw a tangent to the circle making an angle of 30° with a line passing through the centre .

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7. Draw a circle of radius 4.2 cm .Draw a pair of tangents to this circle inclined to each other at an angle of 45° .

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8. Draw a line segment AB of length 8 cm. Taking A as centre, draw a circle of radius 4 cm and taking B as centre, draw another circle of radius 3 cm. Construct tangents to each circle from the centre of the other circle.

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9. Draw a circle with the help of a bangle. Take a point outside the circle. Construct the pair of tangents from this point to the circle.

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10. Draw a circle with centre O and radius 4 cm . Draw any diameter AB of this circle . Construct tangents to the circle at each of the two end points of the diameter AB.

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11. Draw a circle of radius 3 cm. Take two points P and Q on one of its extended diameter each at a distance of 7 cm from its centre. Draw tangents to the circle from these two points P and Q.

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12. Draw a circle of radius 3 cm. Take two points P and Q on one of its extended diameter each at a distance of 7 cm from its centre. Draw tangents to the circle from these two points P and Q.

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13. Draw a line segment of length 7.6 cm and divide it in the ratio $5 : 8$. Measure the two parts.

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14. Draw a line segment of length 8 cm and divides it in the ratio $2 : 3$

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15. Draw two tangents to a circle of radius 3.5 cm from a point P at a distance of 6.2 cm from its centre .

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16. Draw a line segment AB of length 7 cm . Using ruler and compasses , find a point P on AB such that AP:PB: : 3:2 and

AP:AB: :3:5

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Unit V Trigonometry Introduction To Trigonometry Multiple Choice Questions

1. If six $x = \frac{1}{3}$, find the value of $\cot^2 x$.

A. 1

B. 2

C. 3

D. 8

Answer: D

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2. If $\cos A + \cos^2 A = 1$, find the value of $\sin^2 A + \sin^4 A$.

A. 0

B. 1

C. -1

D. 2

Answer: B

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3. $\frac{1+\tan^2 A}{1+\cot^2 A}$ is equal to $\sec^2 A$ (b) -1 (c) $\cot^2 A$ (d) $\tan^2 A$

A. -1

B. $\sec^2 A$

C. 1

D. $\tan^2 A$

Answer: D

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4. Evaluate each of the following :

$2\cos^2 60^\circ + 3\sin^2 45^\circ - 3\sin^2 30^\circ + 2\cos^2 90^\circ$

A. 1

B. 5

C. $\frac{5}{4}$

D. $\frac{1}{4}$

Answer: C

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1. If $(\text{cosec}\theta + \cot\theta) = x$ find $\text{cosec}\theta - \cot\theta$.

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2. If $(1 + \cos A)(1 - \cos A) = \frac{3}{4}$, find the value of sec A.

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3. If $\sin(A - B) = \frac{1}{2}$ and $\cos(A + B) = \frac{1}{2}$, $0^\circ < (A + B) < 90^\circ$ and $A > B$ then find A and B.

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4. If $\sqrt{3}\sin x - \cos x = 0$ and $0 < x < 90$, find the value of x .

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5. If sin x = a and sec x = b , find the value of cot x .

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6. If $2\cos\theta = 1,$ find the value of 2θ

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7. Find the value of $\cot^2 A - \operatorname{cosec}^2 A.$

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8. What is the maximum value $\frac{1}{\operatorname{cosec} A}$ can take ?

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9. Given $\tan\alpha = \frac{5}{12}$, find other trigonometric ratios

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10. Write the values of $\sec 0^\circ, \sec 30^\circ, \sec 45^\circ, \sec 60^\circ$ and $\sec 90^\circ$.

What happens to sec x when x increases from 0° to 90° ?

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11. If $\cos\theta - \sin\theta = \sqrt{2}\sin\theta$, then prove that:

$\cos\theta + \sin\theta = \sqrt{2}\cos\theta$

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12. If $5x = \sec\theta$ and $\frac{5}{x} = \tan\theta$, find the value of $5\left(x^2 - \frac{1}{x^2}\right)$.

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13. If $\sin x = \frac{1}{3}$ then find the value of $\left(2\cot^2 x + 2\right)$.

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14. Evaluate : $5\cos^2 30 + 4\sec^2 30 - \tan^2 45$.

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15. Evaluate : $2\tan^2 60^\circ + \cos^2 30^\circ + \sin^2 60$.

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Unit V Trigonometry Introduction To Trigonometry Long Answer Type Questions

1. Prove that : $\frac{\tan^3\theta}{1+\tan^2\theta}+\frac{\cot^3\theta}{1+\cot^2\theta}=\sec\theta\text{cosec}\ \theta-2\sin\theta\cos\theta.$

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2. if $\sec A=x+\frac{1}{4x}$ then prove that $\sec A+\tan A=2x,\frac{1}{2x}$

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3. If $\sin(A+B)=1$ and $\tan(A-B)=\frac{1}{\sqrt{3}},0^\circ<A,B<90^\circ$, find the value of :

$\tan A+\cot B$

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4. If $\sin(A+B)=1$ and $\tan(A-B)=\frac{1}{\sqrt{3}},0^\circ<A,B<90^\circ$, find the value of :

$\sec A - \text{cosec}\ \ B$

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5. If $\sin\theta = \frac{12}{13}$, find the value of $\frac{\sin^2\theta - \cos^2\theta}{2\sin\theta\cos\theta} \times \frac{1}{\tan^2\theta}$

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6. Show that : $\frac{1}{\sec A - \tan A} - \frac{1}{\cos A} = \frac{1}{\cos A} - \frac{1}{\sec A + \tan A}$

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7. $\sec^2\theta - \frac{\sin^2\theta - 2\sin^4\theta}{2\cos^4\theta - \cos^2\theta} = 1$

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8. If $\sec\theta + \tan\theta = p,$ then find the value of $\cos ec\theta.$

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9. Prove that: $\left(\sin\theta - 2\sin^3\theta\right) = \left(2\cos^3\theta - \cos\theta\right)\tan\theta.$

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Unit V Trigonometry Heights And Distances Multiple Choice Questions

1. A radar detect an aeroplane in the sky at an altitude of 5 km , at an angle of elevation of 45 .

Find the distance of the aeroplane from the radar .

A. $5\sqrt{2}$

B. 4 km

C. 5 km

D. 6 km

Answer: A

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2. A kite is flying at an angle of elevation of 60 , the kite is tied with a string of 60 m . Find the height of the kite .

A. 30 m

B. 40 m

C. $30\sqrt{3}$ m

D. $40\sqrt{3}$ m

Answer: C

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3. A pole cast a shadow of length 20 m on thhe ground , when the sun's elevation is 60° .Find the height of pole .

A. 30 m

B. 40 m

C. 50 m

D. $20\sqrt{3}m$

Answer: D

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Unit V Trigonometry Heights And Distances Very Short Answer Type Questions

1. An observer , 1.7 m tall , is $20\sqrt{3}$ m away from a tower . The angle of elevation from the eye of observer to the top of tower is 30° . Find the height of tower .

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2. A ladder leaning against a wall makes an angle of 60° with the horizontal. If the foot of the ladder is 2.5 m away from the wall, find the length of the ladder.

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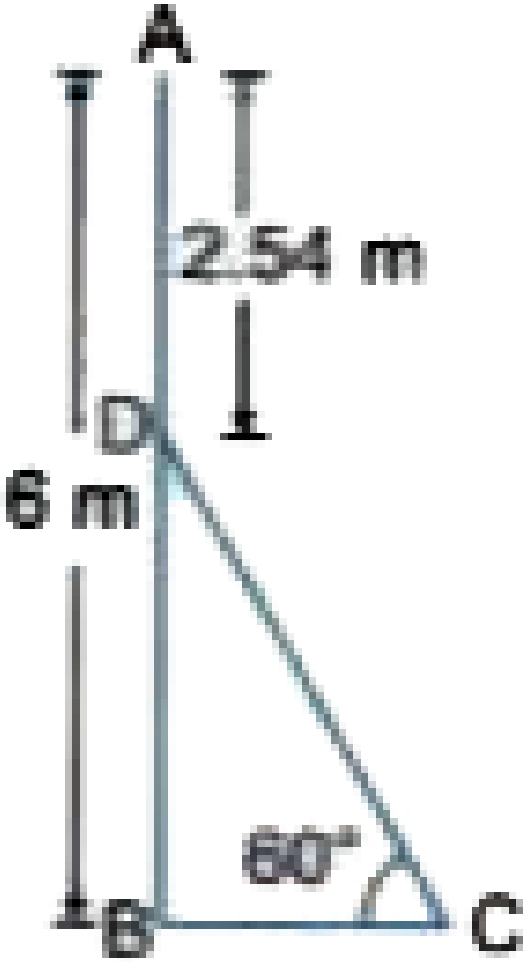
3. In fig AB is a 6m high pole and CD is a ladder inclined at an angle of 60° to the horizontal and reaches up to a point D of pole. If AD=2.54m,

find the length of the ladder. (use $\sqrt{3} = 1.73$)



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4. In triangle ABC, right angled at B, AC = 20 m, $\angle C = 45^\circ$, find the value of AB.

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5. In the following figure, a tower AB is 20 m high and BC, its shadow on the ground, is 20 3 m long. Find the Sun's altitude.

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6. As a plane moves away from a viewer what happens to the elevation of the plane as observed from the same observation point ? Increases or decreases ?

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7. From the foot of a building the elevation of the top of a tower is 45° and from the foot of the twoer the elevation of the top of the building is 60° . Which of the two is shorter ?

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8. The angle of elevation of the top of a tower from the top of a rock is 30° .Which is taller the rock or the tower ?

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9. The shadow of a tower at a particular time of the day is equal to its height , what is the levation of the source of light ?

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10. When the line of sight is below the horizontal level the angle formed is called___.

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11. When a viewer looks at an object which is above his horizontal line of sight , his eyes turn through an angle , the angle through which his eyes turn is the angle of . . . . . (fill in the blank)

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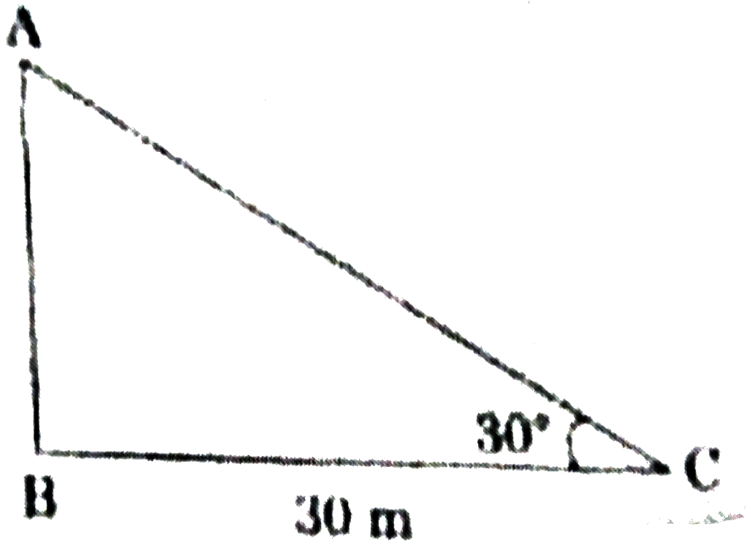
12. The angle elevation of the top of a tower from a point C on the ground. Which is 30 m away from the foot of the tower is 30° . Find

the height of the tower.



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13. What is the angle of elevation of the Sun when the length of the shadow of a vertical pole is equal to its height?

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Unit V Trigonometry Heights And Distances Short Answer Type Questions

1. An aeroplane when flying at a height of 4000m from the ground passes vertically above another aeroplane at an instant when the angles of the elevation of the two planes from the same point on the ground are $60^0 \& 45^0$ respectively. Find the vertical distance between the aeroplanes at that instant.

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2. A vertical tower stands on a horizontal plane and is surmounted by a flagstaff of height 5m. From a point on the ground the angles of elevation of the top and bottom of the flagstaff are 60° and 30° respectively. Find the height of the tower and the distance of the point from the tower. (Take $\sqrt{3} = 1.732$)

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3. Two men on either sideof a 75 m high building and in line with base of buildig observe the angle of elevation of the top of the building as 30° and 60°. Find the distance between the two men. (Use $\sqrt{3} = 1.73$)

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4. A man standing on the deck of a ship, which is 10 m above water level, observes the angle of elevation of the top of a hill as 60° and the angle of depression the base of hill as 30°. Find the distance of the hill from the ship and the height of the hill.

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5. The angles of depression of the top and bottom of a 50 m high buiding from the top of a tower are $45^\circ \text{ and } 60^\circ$ respectively . Find the height of the tower.

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6. On a horizontal plane there is a vertical tower with a flag pole on the top of the tower. At a point 9 metres away from the foot of the tower the angle of elevation of the top and bottom of the flag pole are $60^0 and 30^0$ respectively. Find the height of the tower and the flag pole mounted on it.

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7. A man standing on the deck of a ship, which is 10 m above water level, observes the angle of elevation of the top of a hill as 60° and the angle of depression the base of hill as 30°. Find the distance of the hill from the ship and the height of the hill.

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8. Due to a storm the upper part of a tall tree broke and got bent .It's top struck the ground at a distance of 8 m from its base making an angle of 30 degrees with the ground .What was the height of the tree ?

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Unit V Trigonometry Heights And Distances Long Answer Type Questions

1. The angles of elevation of the top of a tower from two points at a distance of 4 m and 9 m from the base of the tower and in the same straight line with it are 60° and 30° respectively . Find the height of the tower .

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2. A bird is sitting on the top of a 80 m high tree. From a point on the ground, the angle of elevation of the bird is 45°. The bird flies away horizontally in such a way that it remained at a constant height from the ground. After 2 secounds, the angle of elevation of the bird from the same point is 30°. Find the speed of flying of the bird. (Take $\sqrt{3} = 1.732$).

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3. Two poles of equal heights are standing opposite to each other on either side of the road , which is 100 m wide . From a point between them on the road , the angles of elevation of the top of the poles are $60^\circ \text{ and } 30^\circ$ respectively .Find the height of the poles .

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4. From the top of a 7 m high building, the angle of elevation of the top of a tower is 60º and the angle of depression of the foot of the tower is 30º. Find the height of the tower.

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5. A vertical tower stand on a horizontal plane and is surmounted by a vertical flag-staff of height 5 metres. At a point on the plane, the angles of elevation of the bottom and the top of the flag-staff are respectively $30^0 and 60^0$. Find the height of the tower.

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6. The shadow of a tower standing on a level ground is found to be 20 m longer when the sun's altitude is 45° than when it is 60° .Find the height of the tower .

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7. The angle of elevation of a stationary cloud from a point 200 m above the lake is 30° and the angle of depression of its reflection in the lake is found to be 60° . Find the height of the cloud .

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8. A man standing on the deck of a ship, which is 10m above water level. He observes the angle of elevation of the top of a hill as 60^0 and the angle of depression of the base of the hill as 30^0. Calculate the distance of the hill from the ship and the height of the hill.

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9. A kite is flying at a height of 30m from the ground. The length of string from the kite to the ground is 60m. Assuming that three is no

slack in the string, the angle of elevation of the kite at the ground is:

45^0 (b) 30^0 (c) 60^0 (d) 90^0

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10. The angle of elevation of a fighter from point A on the ground is 60° After a flight of 15 seconds the angle of elevation changes to 30° .If the jet is fighting at a speed of 720km/hour. Find the constant height at which the jet is flying.

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Unit Vi Area Related To Circle Areas Related To Circles Multiple Choice Questions

1. The diameter of a circle whose area is equal to the sum of the areas of the two circles of radii 24 cm and 7 cm is

A. 31 cm

B. 25 cm

C. 62 cm

D. 50 cm

Answer: D

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2. The radius of a circle is $\frac{7}{\sqrt{\pi}}$ cm,then the area of the circle is .

A. $154cm^2$

B. $\frac{49}{\pi}cm^2$

C. $22cm^2$

D. $49cm^2$

Answer: D

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3. If the perimeter of a circle is equal to that of a square, then the ratio of their areas is

A. $22:7$

B. $14:11$

C. $7:22$

D. $11:14$

Answer: B

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4. The circumference of circle is 154 m , then radius is

A. 7 m

B. 14 m

C. 7.5

D. None of these

Answer: D

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5. If the sum of the circumferences of two circles with radii R_1 and R_2 is equal to the circumference of a circle of radius R, then

A. $R1 + R2 = R$

B. $R1 + R2 > 2$

C. $R1 + R2 < R$

D. None of the above

Answer: A

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6. The circumference of a circular field is 528 cm . Then its radius is

A. 42 cm

B. 84 cm

C. 72 cm

D. 56 cm

Answer: B

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7. The area of incircle of an equilateral triangle is $154\,cm^2$. The perimeter of the triangle is (a) 71.5 cm (b) 71.7 cm (c) 72.3 cm (d) 72.7 cm

A. 71.5 cm

B. 71.7 cm

C. 72.3 cm

D. 72.6 cm

Answer: D

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8. The radius of a bicycle wheel is 14 cm . The distance covered by the wheel after making 50 complete rotation is

A. 88 cm

B. 2200 cm

C. 440 cm

D. 4400 cm

Answer: D

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Unit Vi Area Related To Circle Areas Related To Circles Very Short Answer Type Questions

1. The circumference of a circle is equal to sum of circumference of 2 circles having diameter 34 cm and 28 cm . Find the radius of the new circle .

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2. A racetrack is in the form of a ring whose inner and outer circumferences are 437m and 503 m respectively. Find the width of the track and also its area.

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3. Find the radius of the circle whose area is numerically equal to three times its circumference .

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4. Find the perimeter of a protractor having length of its base as 14 cm .

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Unit Vi Area Related To Circle Areas Related To Circles Short Answer Type Questions

1. The area of an equilateral triangle is $1732.05\,cm^2$. About each angular point as centre, a circle is described with radius equal to half

the length of the side of the triangle. Find the area of the triangle not included in the circles. $(Use\ \pi = 3.14)$.

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2. Fig. 12.26 depicts a racing track whose left and right ends are semicircular. The distance between the two inner parallel line segments is 60 m and they are each 106 m long. If the track is 10 m wide, find : (i) the distance around the track alon

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3. Fig. 12.26 depicts a racing track whose left and right ends are semicircular. The distance between the two inner parallel line segments is 60 m and they are each 106 m long. If the track is 10 m wide, find : (i) the distance around the track alon

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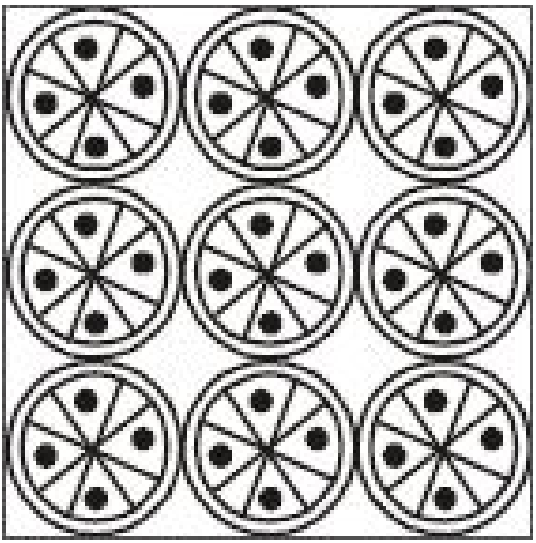
4. On a square handkerchief, nine circular designs each of radius 7 cm are made. Find the area of the remaining portion of the handdkerchief



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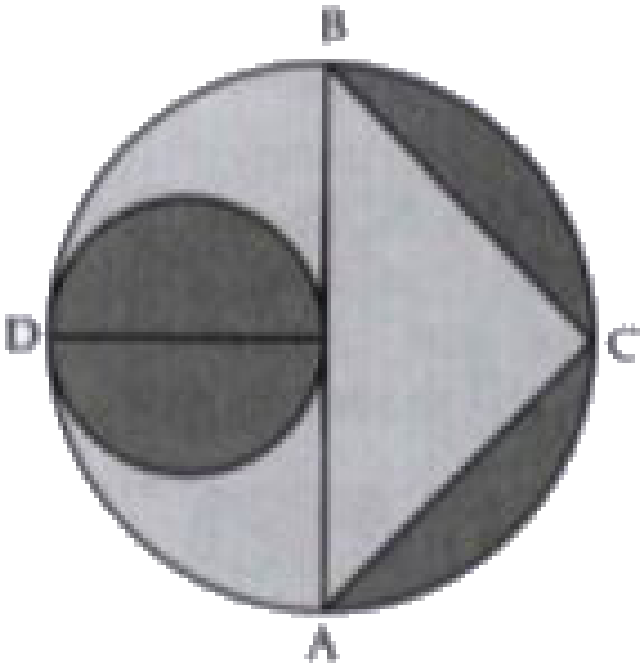
5. In figure , AB and CD are two diameters of a circle (with centre O) perpendicular to each other and OD is the diameter of the smaller

circle . If OA = 7 cm , find the area of the shaded region.



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6. If the perimeter and the area of a circle are numerically equal, then the radius of the circle is.

A. 2 units

B. π units

C. 4 units

D. 7 units

Answer:

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7. The radii of two circles are 3cm and 4 cm respectively . Find the radius of the circle having area equal to the sum of the areas of the two circles .

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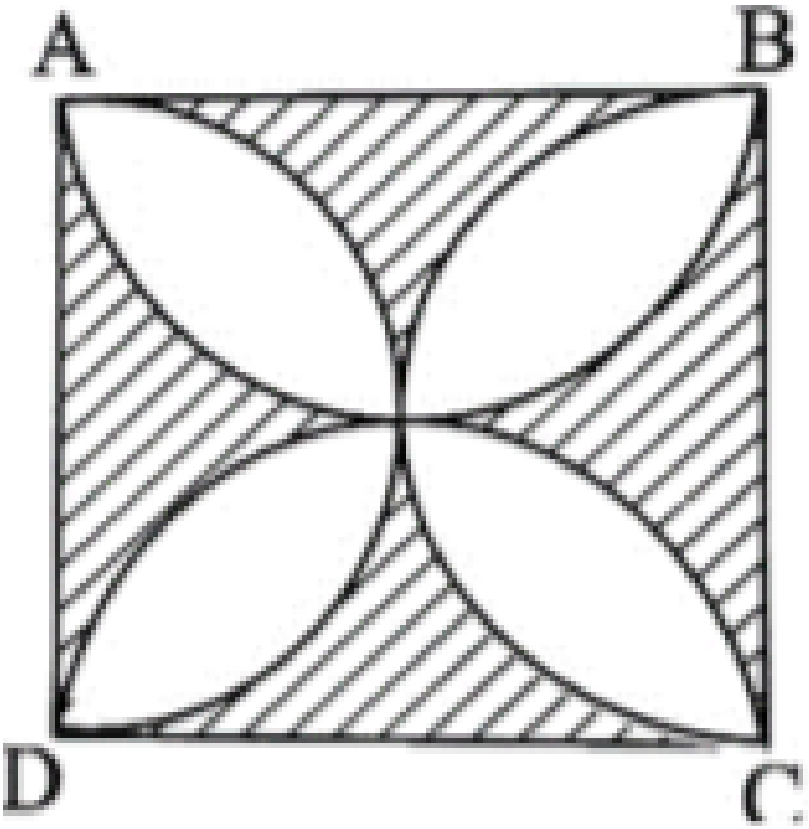
8. In the figure, ABCD is a square of side 14 cm. Semi-circles are drawn with each side of square as diameter. Find the area of the shaded

region.



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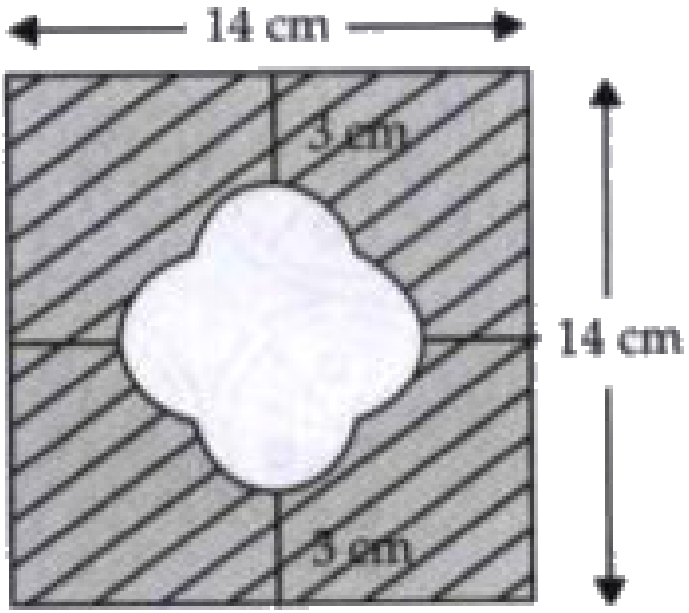
9. In figure , find the area of the shaded region



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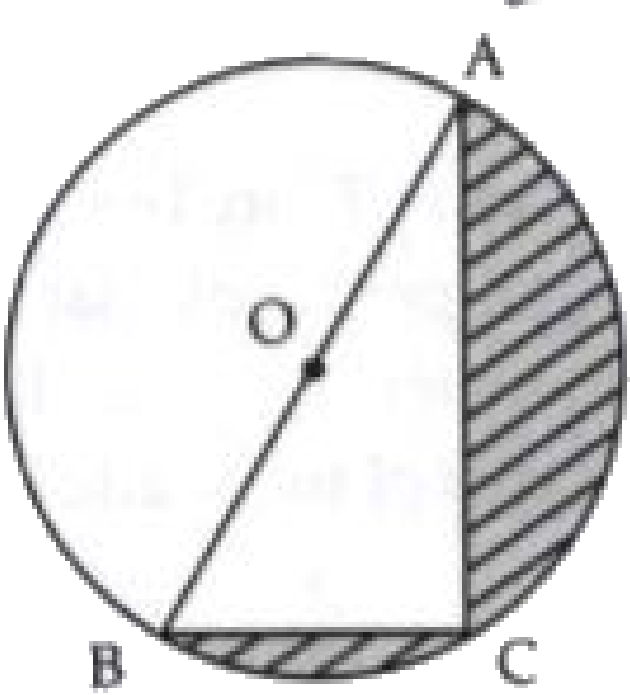
10. In figure , O is the centre of a circle such that diameter AB= 13 cm and AC = 12 cm . BC is joined .find the area of the shaded region .



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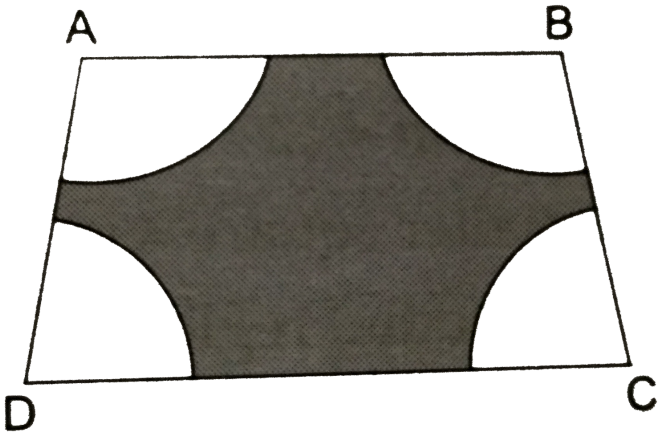
11. In the given figure ABCD is a trapezium in which $AB \| DC, AB = 18cm, DC = 32cm$ and the distance between AB and DC is 14 cm. If arcs of equal radii 7 cm hav been drawn with centres

A,B,C and D then find the area of the shaded region.



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12. The hour and minute hands of a clock are 4 cm and 6 cm long respectively. Find the sum of the distances travelled by their tips in 2 days.

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13. Find the area of a segment of a circle of radius 2 km , if the arc of the segment has a measure of 60° .

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14. Find the radius of the circle whose area is equal to the sum of the areas of three smaller circles of radii 3 cm , 4 cm and 12 cm .

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15. The minute hand of a clock is 8 cm long. Find the area swept by the minute hand between 8.30 a.m . And 9.00 a.m.

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16. A horse is tethered to a corner of a rectangular field 80 m by 50 m by a rope of length 7 m . Find the area over which it can graze . Also find the area beyond his reach .

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17. Find the radius of a circle whose circumference is sum of the circumferences of ten circles of radii 4 cm , 7 cm , 10 cm , 13 cm . . . . . etc.

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Unit Vi Area Related To Circle Areas Related To Circles Long Answer Type Questions

1. All the vertices of a rhombus lie on a circle. Find the area of the rhombus, if area of the circle is $1256cm^2$. (use $\pi = 3.14$)

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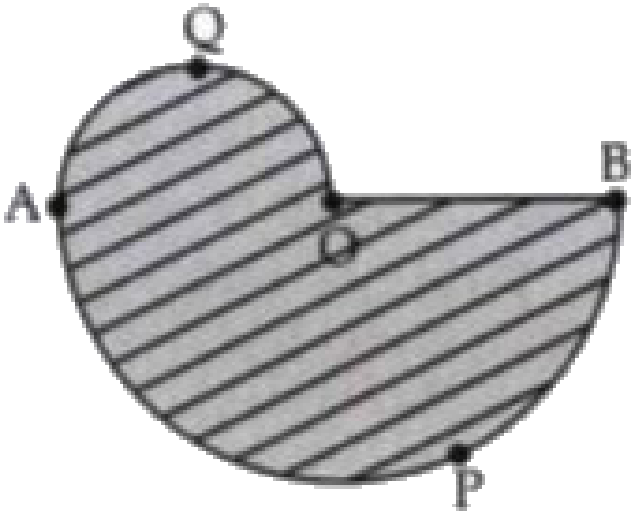
2. In figure ,APB and AQO semicircle , and AO = OB . If the perimeter of the figure is 40 cm , find the area of the shaded region .



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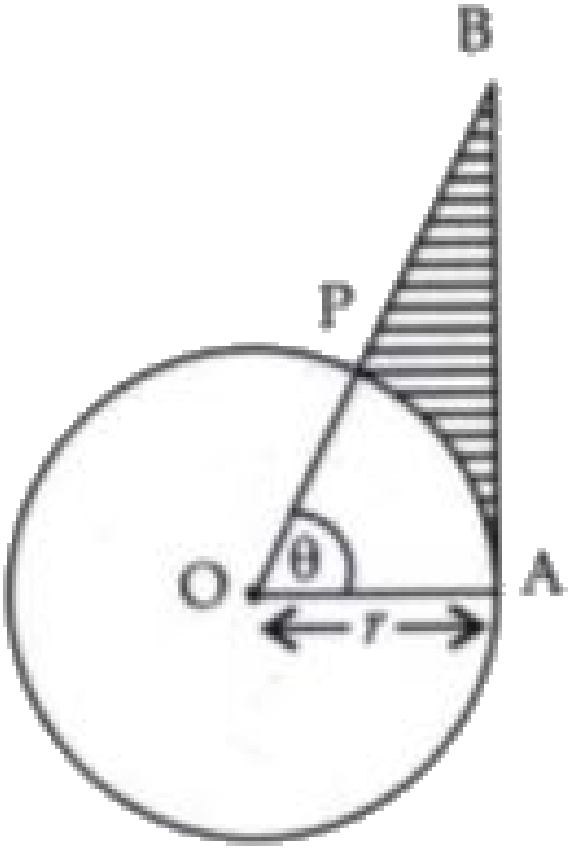
3. In figure , is shown a sector OAP of a circle with centre O , containing $\angle\theta$. AB is perpendicular to the radius OA and meets OP produced at B . Prove that the perimeter of shaded region is

$$r\left[\tan\theta+\sec\theta-1-\frac{\pi\theta}{180}\right]$$



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4. A wire is looped in the form of a circle of radius 28 cm. It is re-bent into a square form. Determine the length of the side of the square.

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5. The sum of the radii of two circles is 140 cm and the difference of their circumferences is 88 cm. Find the diameters of the circles.

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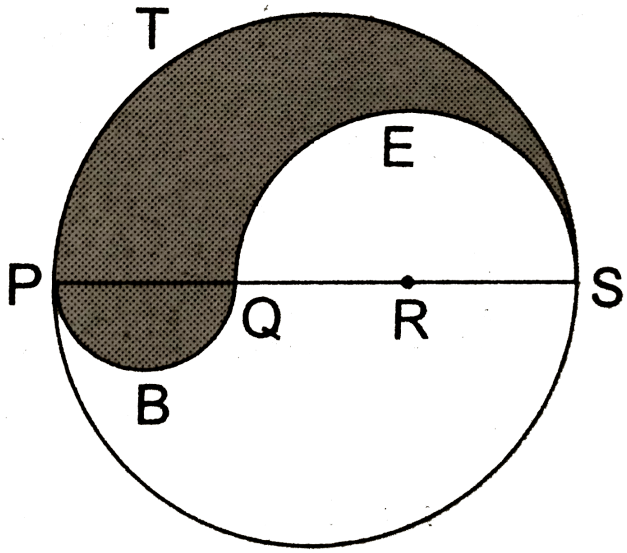
6. PQRS is a diameter of a circle of radius 6cm. The lengths PQ,QR and RS are equal. Semicircles are drawn with PQ and QS is diameters, as shown in the given figure. If $PS = 12cm,$ find the perimeter and area of the shaded region.



[Take $\pi = 3.14$]

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Unit Vi Area Related To Circle Surface Areas And Volumes Multiple Choice Questions

1. A solid is hemispherical at the bottom and conical (of same radius) above it . If the surface areas of the two parts are equal then the ratio of its radius and the slant height of the conical part is

A. $1:3$

B. $1:\sqrt{3}$

C. $1:1$

D. $1:7$

Answer: B

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2. A right circular cylinder of radius r cm and height h cm (where , h gt 2r) just encloses a sphere of diameter

A. r cm

B. 2r cm

C. h cm

D. 2h cm

Answer: B

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3. A solid sphere of radius r is melted and cast into the shape of a solid cone of height r , the radius of the base of the cone is $2r$ (b) $3r$ (c) r (d) $4r$

A. 2r

B. 3r

C. r

D. 4r

Answer: A

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Unit Vi Area Related To Circle Surface Areas And Volumes Very Short Answer Type Questions

1. A right circular cone of radius 3 cm , has a curved surface area of $47.1cm^2$. Find the volume of the cone , (use $\pi = 3.14$)

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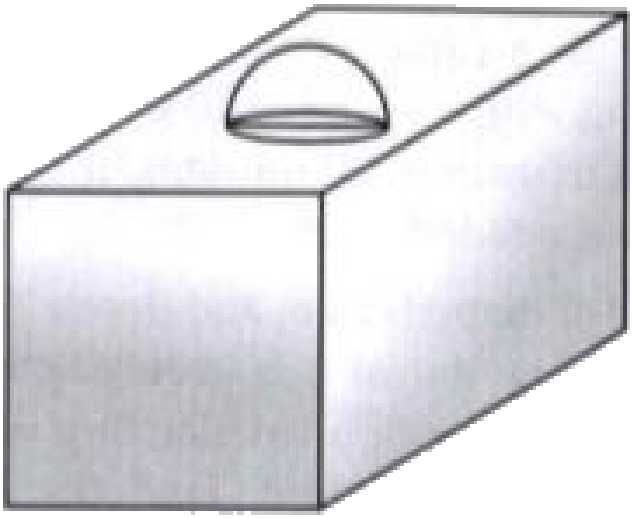
2. In Figure , a decorative block, made up of two solids a cube and a hemisphere . The base of the block is a cube of side 6 cm and the hemisphere fixed on the top has a diameter of 3.5 cm .Find the total

surface area of the block (use $\pi = \frac{22}{7}$)



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3. 2 cubes each of volume $64\ cm^3$ are joined end to end. Find the surface area of the resulting cuboid.

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4. If we reduce the height of a cyliner by $\frac{1}{4}$ and double the radius , what will be the impact on the volume ?

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Unit Vi Area Related To Circle Surface Areas And Volumes Short Answer Type Questions

1. A vessel in the form of a hollow hemisphere mounted by a hollow cylinder. The diameter of the hemisphere is 14 cm and the total height of the vessel is 13 cm. Find the inner surface area of the vessel.

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2. A 20 m deep well with diameter 7 m is dug and the earth from digging is evenly spread out to form a platform 22 m by 14 m. Find the height of the platform.

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3. Metallic spheres of radii 6 cm, 8 cm and 10 cm respectively, are melted to form a single solid sphere. Find the radius of the resulting sphere.

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4. A pen stand made of wood is in the shape of a cuboid with four conical depressions to hold pens. The dimensions of the cuboid are 15 cm by 10 cm by 3.5 cm. The radius of each of the depressions is 0.5 cm and the depth is 1.4 cm. Find the volume o

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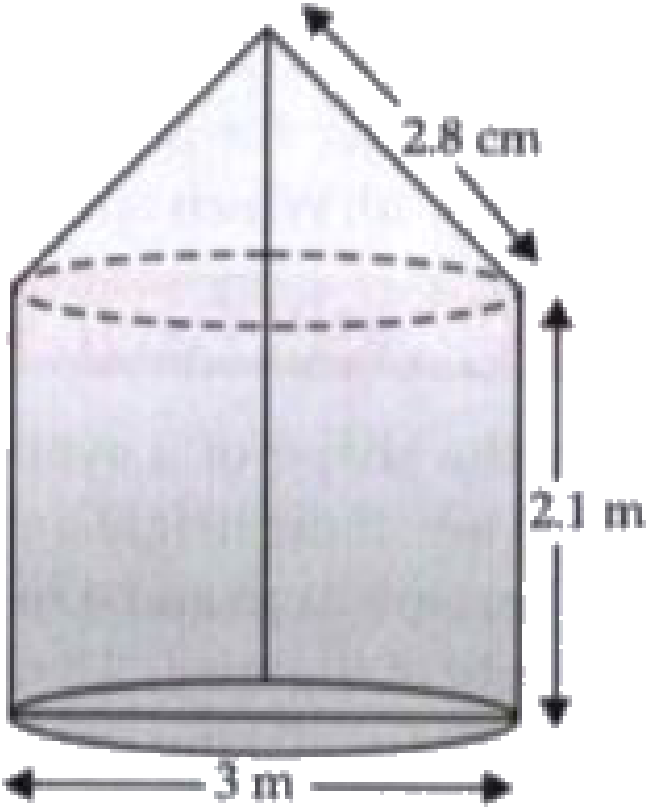
5. In figure , a tent is in the shape of a cylinder surmounted by a conical top of same diameter . If the height and diameter of cylindrical part are 2.1 m and 3 m respectively and the slant height of conical part is 2.8 m , find the cost of convas needed to make the tent if the canvas is available at the rate of rupees 500/sq.metre .(use $\pi = \frac{22}{7}$)



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6. A toy is in the form of a cone mounted a hemisphere of diameter 7 cm. the total height of the toy is 14.5 cm. find the volume and the total surface area of the toy. (Take $\pi = \frac{22}{7}$).

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7. The sum of radius of base and height of a solid right circular is 37 cm . If the total surface area of the solid cylinder is 1628 sq.cm ,find the volume of the cylinder , (use $\pi = \frac{22}{7}$)

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8. A well of diameter 4 m is dug 21 m deep . The earth taken out of ot has been spread envenly all around it in the shape of a circular ring of width 3 m to form an embankment .Find the height of the embankment .

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9. A sphere of diameter 6 cm is dropped in a right circular cylindrical vessel partly filled with water. The diameter of the cylindrical vessel is 12 cm. If the sphere is completely submerged in water, by how much will the level of water rise in the cylindrical vessel?

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10. From a solid cylinder whose height is 12 cm and diameter 10 cm , a conical cavity with the same base and height is taken out . Find the total surface area of the ramaining solid .

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11. Three identical cubes each of volume 343 are joined end to end . Find the surface area of the resulting cuboid .

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12. A solid metallic sphere of diameter 16 cm is melted and recast into a number of smaller cones each of radius 4 cm and height 8 cm. Find the number of cones so formed.

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13. From a solid cylinder of height 24 cm and radius 7 cm , a conical cavity of the same height and same radius is taken out . Find the volume of remaining solid .

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14. Karuna bought ice cream (in a plastic cone of radius 3.5 cm and height 7 cm) for Rs 20 . Rajat bought ice cream (in a plastic cylinder for radius and height 7 cm and 3.5 cm) for Rs 20 . Which is a better deal ? Why ?

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Unit Vi Area Related To Circle Surface Areas And Volumes Long Answer Type Questions

1. A tent is in the shape of a cylinder surmounted by a conical top. If the height and diameter of the cylindrical part are 2.1 m and 4 m respectively, and the slant height of the top is 2.8 m, find the area of the canvas used for making the tent. A

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2. A medicine capsule is in the shape of acylinder with two hemispheres stuck to each of its ends. The length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm. Find its surface area.

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3. Due to heavy floods in a state, thousands were rendered homeless. 50 schools collectively offered to the state government to provide place and the canvas for 1500 tents to be fixed by the government and decided to share the whole expenditure equally. The lower part of each tent is cylindrical of base radius 2.8 m and height 3.5 m, with conical upper part of same base radius but of height 2.1 m. If the canvas used to make the tents costs Rs. 120 per sq. m, find the amount shared by each school to set up the tents. What value is generated by the above problem ? (Use $\pi = \frac{22}{7}$)

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4. A cylinderical container of diameter 12 cm and height 15 cm is filled with ice cream. The whole ice cream has to be distributed to 10 children in equal cones with hemispherical tops. If the height of the conical portion is four times the radius of its base, find the radius of the ice cream cone.

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5. A hemispherical tank full of water is emptied by a pipe at the rate of $3\frac{4}{7}$ litres per second. How much time will it take to make the tank half-empty, if the tank is 3 m in diameter?

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6. A farmer connects a pipe of internal diameter 25 cm from a canal into a cylindrical tank in his field, which is 12 m in diameter and 2.5m

deep. If water flows through the pipe at the rate of 3.6 km/hr, in how much time will the tank be filled ? Also, find the cost of water if the canal depertment charges at the rate of ₹ 0.07 per m^3.

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7. A solid metallic sphere of diameter 21 cm is melted and recast into a number of smaller cones, each of diameter 3.5 cm and height 3 cm. Find the number of cones so formed.

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8. Water in a canal, 6 m wide and 1.5 m deep, is flowing with a speed of 10 km/h. How much area will it irrigate in 30 minutes, if 8 cm of standing water is needed?

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9. A well of diameter 4 m and depth 21 m is dug . The earth taken out of it is evenly spread all around it in the shape of a circular ring of width 3 m to form an embankment . Find the height of the embankment .

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10. The height of a cone is 30 cm .A small cone is cut off at the top by a plane parallel to the base . If its volume be $\frac{1}{27}$ of the volume of the given cone, at what height above the base the section has been made?

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11. A vessel is in form of an inverted cone . Its height is 8 cm and the radius is 5 cm . It is filled with water up to the rim .When lead shots , each of which is a sphere of radius 0.5 cm , are dropped into the vessel , one fifth of the water flows out . Find the number of lead shots dropped into the water .

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12. A farmer connects a pipe of internal diameter 20 cm from a canal into a cylindrical tank in her field, which is 10 m in diameter and 2 m deep. If water flows through the pipe at the rate of 3 km/h, in how much time will the tank be filled?

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13. A conical vessel of radius 6cm and height 8cm is completely filled with water. A sphere is lowered into the water and its size is such that when it touches the sides, it is just immersed as shown Figure. What fraction of water over flows?

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1. Empiricla relationship between the three measures of central tendency is

A. 2 Mean = 3 Median - Mode

B. 2 Mode = 3 Median - Mean

C. mode = 2 Mean - 3 Median

D. 3 median = 2 Mode + Mean

Answer: A

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2. If the 'less than ' and the 'more than' ogive given intersect at the point (27,34) , then find the median of the distribution and also find the total number of observations .

A. 27,34

B. 54,34

C. 54,68

D. 27,68

Answer: D

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3. If the mode of a data is 45 and mean is 27 , then the median is

A. 30

B. 27

C. 33

D. none of the above

Answer: C

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4. A set of numbers consists of three 4's , two 5"s , six 6's , eight 8's and sevan 10's .What is the mode of this collection of numbers ?

A. 10

B. 7.5

C. 7

D. 8

Answer: D

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5. Which measure of central tendency is given by the x -coordinate of the point of intersection of the more than ogive and less than ogive?

A. mean

B. median

C. mode

D. none of the above

Answer: B

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6. While computing mean of grouped data, we assume that the frequecies are

A. evenly distributed over all the class

B. centered at the class mariks of the class

C. centered the upper limits of the class

D. centered the lower limits of the class

Answer: B

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7. The wickets taken by a bowler in 10 cricket matches are as follows: 2 6 4 5 0 2 1 3 2 3 Find the mode of the data.

A. 1

B. 2

C. 4

D. 3

Answer: D

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8. Find the sum of frequencies

Marks	Frequency
130 – 135	10
135 – 140	15
140 – 145	18
145 – 150	22
150 – 155	23
155 – 160	8
160 – 165	4

A. 90

B. 80

C. 100

D. 88

Answer: C

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9. Find the lower limit of the median class

Height (in cm)	No. of students
150 – 155	15
155 – 160	13
160 – 165	10
165 – 170	8
170 – 175	9
175 – 180	5

A. 165

B. 155

C. 160

D. 170

Answer: C

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Unit Vii Statistics And Probability Statistics Very Short Answer Type Questions

1. In a frequency distribution , if a =assumed mean = 55 , $\sum f_i = 100, h = 10$ and $\sum f_i \mu_i = -30$, then find the mean of the distribution.

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2. Find mode , using an empirical relation , when it is given that mean and median are 10.5 and 9.6 repsectively .

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3. In a frequency distribution mode is 7.88 , mean is 8.32 .find the median

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4. The class in which mode lies is called as . . . . . .

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5. If mean = 31.04 and median = 30.625 , then find the mode .

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6. The mean and median of a distribution are both equal to 635.97 .Find the mode .

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Unit Vii Statistics And Probability Statistics Short Answer Type Questions

1. If the mean of the following distribution is 54 , find the missing frequency x :

Class	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Frequency	16	14	24	26	x

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2. The following table shows the distribution of weights of 100 candiates appearing for a competition . Determine the modal weight .

Weight (in kg)	No. of candidates
50 – 55	13
55 – 60	18
60 – 65	45
65 – 70	16
70 – 75	6
75 – 80	2

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3. Some students of Class X donated for the welfare of old age persons

. Their contributions are shown in the following frequnecy distribution

:

Amount (in ₹)	No. of students
0 – 20	5
20 – 40	8
40 – 60	12
60 – 80	11
80 – 100	4

Find median and mode for their contribution .

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4. The average score of boys in an examination of a school is 71 and that of girls is 73. The average score of school in that examinations is 71.8. The ratio of the number of boys to the number of girls appeared in the examination, is

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5. The following data gives the information on the observed lifetimes (in hours) of 225 electrical components: Determine the modal lifetimes of the components.

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6. Determine the missing frequnecy x , from the following data , when Mode is 67 .

Class	40 – 50	50 – 60	60 – 70	70 – 80	80 – 90
Frequency	5	x	15	12	7

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7. Find the unknown values in the following table :

Class interval	Frequency	Cumulative frequency
0 – 10	5	5
10 – 20	7	x_1
20 – 30	x_2	18
30 – 40	5	x_3
40 – 50	x_4	30

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8. The mode of a distribution is 55 and the modal class is 45-60 and the frequency preceding the modal class is 5 and the frequnecy after the modal class is 10 . Find the frquency of the modal class .

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9. Find the mean of 30 numbers given mean of ten of them is 12 and the mean of remaining 20 is 9 .

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10. The mean of 5 numbers is 10 . If 3 decrease each number , find the mean of the new number .

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11. The median of a data is 20 . If each item is increased by 2 , find the new median .

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12. The mean of 20 observations is 12 . If each observation is increased by 5 , then find the new mean .

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13. The mean of $6, 6+2x, 5$ and 8 and $8+3x$ is 20 . Find the value of x .

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14. Find the Mode of the following data :

Class Intervals	Frequencies
10 – 14	30
15 – 19	45
20 – 24	75
25 – 29	35
30 – 34	25
35 – 39	10

Also if the Median of the distribution is 20.8 , find the Mean .

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1. The lengths of 50 leaves of a plant are measured correct to the nearest millimetre and the data obtained is represented in the following table .

Length (in mm)	No. of leaves
109 – 117	4
118 – 126	6
127 – 135	14
136 – 144	13
145 – 153	6
154 – 162	4
163 – 171	3

Find the mean length of the leaves .

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2. about to only mathematics

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3. If the median of the following frequency distribution is 32.5 .Find the values of f_1 and f_2 .

Class	Frequency
0 – 10	f_1
10 – 20	5
20 – 30	9
30 – 40	12
40 – 50	f_2
50 – 60	3
60 – 70	2
Total	40

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4. The mean of x and $\frac{1}{x}$ is N then the mean of x^2 and $\frac{1}{x^2}$ is

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Unit Vii Statistics And Probability Probability Multiple Choice Questions

1. A number is chosen at random from the numbers $-5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5$. Then the probability that square of this number is less than or equal to 1 is _____ .

A. $\frac{2}{11}$

B. $\frac{6}{11}$

C. $\frac{3}{11}$

D. $\frac{1}{11}$

Answer: C

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2. Find the probability that a leap year will have 53 Friday or 53 Saturdays.

A. 0

B. $\frac{2}{7}$

C. $\frac{3}{7}$

D. $\frac{1}{7}$

Answer: C

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3. One card is drawn from a well shuffled deck of 52 cards. The probability that it is black queen is

A. $\frac{1}{26}$

B. $\frac{1}{13}$

C. $\frac{1}{52}$

D. $\frac{2}{13}$

Answer: A

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4. Probability that tomorrow will be holiday is 0.58 . Probability that tomorrow will not be a holiday is

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5. Which of the following cannot be the probability of an event ?

A. 0.7

B. 0

C. 1.2

D. 0.18

Answer: C

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6. The probability of getting a bad egg in a lot of 400 is 0.035. The number of bad eggs in the lot is

A. 7

B. 14

C. 21

D. 28

Answer: B

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Unit Vii Statistics And Probability Probability Very Short Answer Type Questions

1. A letter of English alphabet is chosen at random. Determine the probability that the chosen letter is a consonant.

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2. 20 tickets, on which numbers 1 to 20 are written, are mixed throughly and then a ticket is drawn at random out of them. Find the probability that the number on the drawn ticket is a multiple of 3 or 7.

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3. A card is drawn at random from a well shuffled pack of 52 playing cards. Find probability of getting neither a red card nor a queen.

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4. Cards marked with numbers $3, 4, 5. \ldots . .50$ are placed in a box and mixed throughly. A card is drawn at random from the box, find the probability that the selected card bears a perfect square number.

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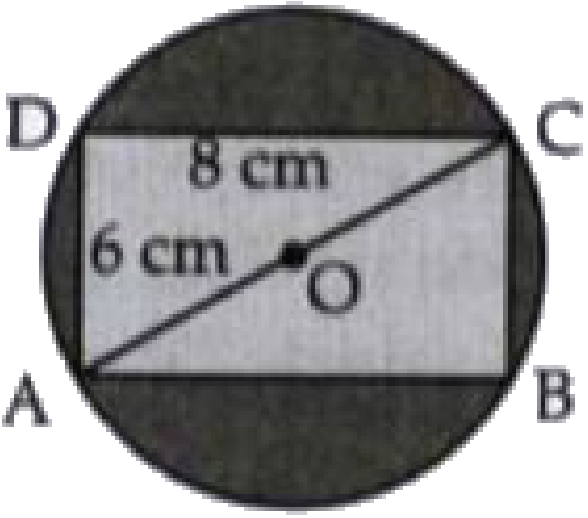
5. In the adjoining figure a dart is thrown at the dart board and lands in the interior of the circle . What is the probability that the dart will land in the shaded region.



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6. A number x is selected from the numbers 1,2,3 and then a second number y is randomly selected from the numbers 1,4,9. What is the probability that the product xy of the two numbers will be less than 9?

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7. An integer is chosen at random from list two hundred natural numbers then the probability that integer is either divisible by 2,6 or 8 is

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8. An integer is chosen between 70 and 100, Find the probability that it is.

(a) a prime number

(b) divisible by 7

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9. An integer is chosen between 0 and 100. What is the probability that it is

(i) divisible by 7 (ii) not divisible by 7?

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10. Jayanti throws a pair of dice and records the product of the numbers appearing on the dice. Pihu throws 1 dice and records the squares the number that appears on it. Who has the better chance of getting the number 36? Justify?

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11. If two coins are tossed simultaneously. Find the probability of getting 2 heads.

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12. A lot of 25 bulbs contain 5 defective ones. One bulb is drawn at random from the lot. What is the probability that the bulb is good.

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13. A die is rolled , Find the probability of getting a 6 .

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14. There are 5 blue , 6 red and 7 green balls in a bag . If a ball is picked up at random ,what is the probability of getting a non blue ball ?

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15. Find the probability of 53 Sundays in an ordinary year.

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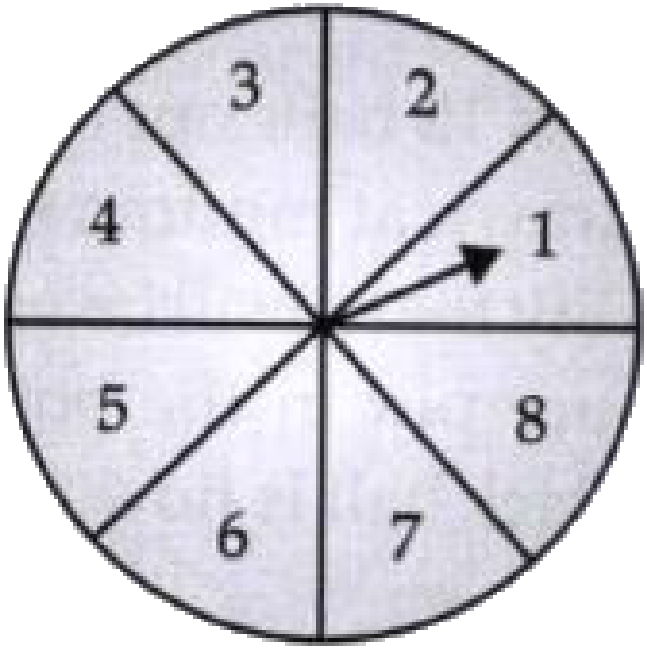
Unit Vii Statistics And Probability Probability Short Answer Type Questions

1. A game of chance consists of spinning an arrow on a circular board , divided into 8 equal parts , which comes to rest pointing at one of the numbers 1,2,3,.....8 which are equally likely outcomes . What is the probability that the arrow will point

(a) at an odd number

(b) a number greater than 3

(c) a number less than 9 .



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2. A game consists of tossing a one-rupee coin three times and noting its outcome each time. Hanif wins if all the tosses give the same result, i.e., three heads or three tails and loses otherwise. Calculate the probability that Hanif will lose the game.

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3. There are hundred cards in a bag on which numbers from 1 to 100 are written. A card is taken out from the bag at random. Find the probability that the number on the selected card.

It is divisible by 9 and is a perfect square

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4. There are hundred cards in a bag on which numbers from 1 to 100 are written. A card is taken out from the bag at random. Find the probability that the number on the selected card.

is a prime number greater than 80.

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5. From a pack of 52 playing cards , Jacks , Queens and Kings of red colour red colour are removed . From the remaining , a card is drawn at random . Find the probability that drawn card is :

a black king

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6. From a pack of 52 playing cards Jacks, queens, kings and aces of red colour are removed. From the remaining, a card is drawn at random. Find the probability that the card drawn is : a black queen (ii) a red card (iii) a black jack

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7. From a pack of 52 playing cards , Jacks , Queens and Kings of red colour red colour are removed . From the remaining , a card is drawn at

random . Find the probability that drawn card is :

a card of black colour .

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8. Three different coins are tossed together . Find the probability of getting

exactly two heads

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9. Three different coins are tossed together . Find the probability of getting

at least two heads

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10. Three different coins are tossed together . Find the probability of getting

at least two tails .

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11. Salesman was having a lot of 100 shirts of which 88 are good, 8 have minor defects and 4 have major defects. Suresh, a shopkeeper will buy only those shirts which are good. If a shirt is selected at random from the lot, what is the probability that he will buy the shirt?

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12. A box consists of 100 shirts of which 88 are good , 8 have minor defects and 4 have major defects . Ramesh , a shopkeeper will buy only those shirt which are good but 'Kewal ' another shopkeeper will not

buy shirts with major defects . A shirt is taken out of the box at random .What is the probability that

'Kewal' will buy the selected shirt ?

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13. Two different dice are thrown together .Find the probability of :

getting a number greater than 3 on each die .

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14. Two different dice are thrown together .Find the probability of :

getting a total of 6 or 7 of the numbers on two dice .

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15. In a single throw of a pair of different dice, what is the probability of getting

(i) a prime number on each dice

(ii)a total of 9 or 11?

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16. In a single throw of a pair of different dice, what is the probability of getting

(i) a prime number on each dice

(ii)a total of 9 or 11?

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17. A bag contains 5 red balls and some blue balls. If the probability of drawing a blue ball is double that of a red ball, determine the number

of blue balls in the bag.

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18. A bag contains 8 red balls and x blue balls , the odd against drawing a blue ball are $2:5$ What is the value of x ?

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19. A box contains 12 balls out of which x are black. If one ball is drawn at random from the box, what is the probability that it will be a black ball? If 6 more black balls are put in the box, the probability of drawing a black ball is now double o

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20. A die is rolled. Find the probability of getting a number greater than 6.

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21. A die is rolled , find the probability of getting a number less than 10 .

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22. Find the probability of having 5 Mondays in the month of August .

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23. There are cards in a bag numbered from 7 to 100 . A card is taken out from the bag at random . Find the probability that the number on

the selecteed card :

Is an even perfect square .

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24. There are hundred cards in a bag on which numbers from 1 to 100 are written. A card is taken out from the bag at random. Find the probability that the number on the selected card.

is a prime number greater than 80.

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25. A bag contains tickets numbered from 10 to 50 . One ticket is drawn at random . Find the probability that the number on the card is (i) prime (ii) a perfect square .

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26. A bag contains 24 balls of which x are red, 2x are hwite and 3x are blue. A ball is selected at random. What is the probability that it is

(i) not red? (ii) white

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27. A bag contains 24 balls of which x are red, 2x are hwite and 3x are blue. A ball is selected at random. What is the probability that it is

(i) not red? (ii) white

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28. Three unbiased coins are tossed. What is the probability of getting at most two heads ?

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29. Three unbiased coins are tossed together . What is the probability of getting

at least one head ?

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30. A die is thrown twice. What is the probability that:

(i) 3 will not come up either time?

(ii) 3 will come up at least once?

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31. A die is thrown twice . What is the probability that :

3 will come up at least once ?

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32. The quality control officer at a tire factory reported that 20 tires were defective out of a sample of $10,000$ tires . A tire is selected , what are the chances that the tire selected is not defective ?

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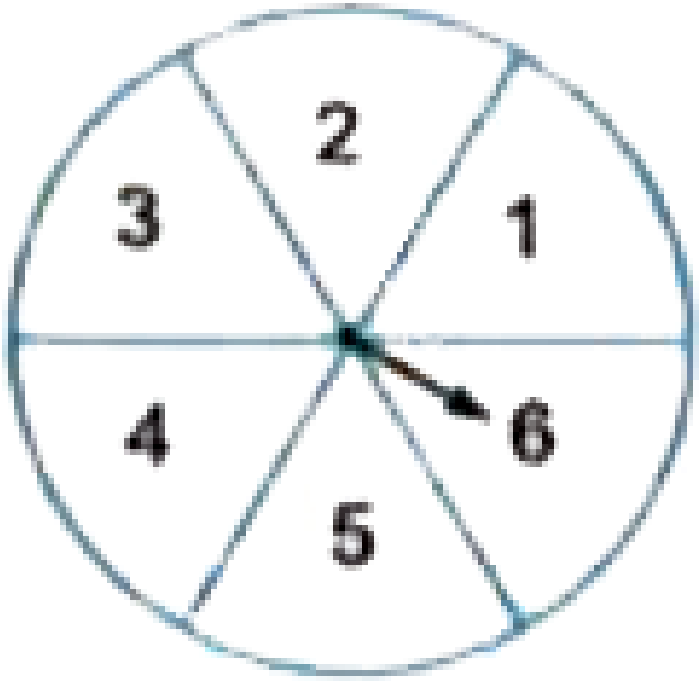
Unit Vii Statistics And Probability Probability Long Answer Type Questions

1. In Fig., shown a disc on which a player spins an arrow twice. The function $\frac{a}{b}$ is formed, where 'a' is the number of sector on which arrow stops on the first spin and 'b' is the number of the sector in which the arrow stops on second spin. On each spin, each sector has equal chance of selection by the arrow. Find the probability that the fraction

$\frac{a}{b} > 1.$



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2. A number x is selected at random from the numbers 1,4,9,16 and another number is selected at random from the numbers 1,2,3,4 .Find the probability that the value of xy is more than 16 .

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3. A number x is selected at random from the numbers 1, 2, 3 and 4. Another number y is selected at random from the numbers 1, 4, 9 and 16. Find the probability that product of x and y is less than 16.

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4. A jar contains 54 marbles each of which is blue, green or white. The probability of selecting a blue marble at random from the jar is $\frac{1}{3}$, and the probability of selecting a green marble at random is $\frac{4}{9}$. How many white marbles does the jar contain?

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5. One card is drawn from a well-shuffled deck of 52 cards. Find the probability of getting : a spade

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6. A card is drawn from a well shuffled deck of cards

What are the odds against getting a spade ?

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7. A card is drawn from a well - shuffled deck of 52 cards. Find (i) the odds in favour of getting a face card, and (ii) the odds against getting a spade.

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8. A card is drawn from a well shuffled deck of cards

What are the odds in favour of getting a red king .

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9. A pair of dice are rolled simultaneously .Find the pobability of getting a (i) sum of 9 or 11 on the dice (ii) product of 6 on the dice .

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10. From a deck of playing cards , an clubs , aces and jacks are removed .The deck is shuffled well and then a card is drawn ot at random . What is the probability that the card drawn is (i) a queen (ii) a face card (iii) a red card?

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11. Two dice are rolled simultaneously .Find the probability of getting (i) total of 8 or 10 (ii) product 12 .

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12. The king, queen and jack of clubs are removed from a deck of 52 playing cards and then well shuffled. One card is selected from the remaining cards. Find the probability of getting (i) a heart (ii) a king (iii) a club (iv) the '10' of hearts.

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