



MATHS

BOOKS - EDUCART PUBLICATION

SAMPLE PAPER 9

Section A

1. If $6^n - 5^n$ always end with a digit, where n is any natural number, then the desired digit is

- A. 1
- B. 5
- C. 3
- D. 7

Answer:



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2. For what value of k the pair of linear equations $kx - y = 2$ and $6x - 2y = 3$ has unique solution.

A. $k = 0$

B. $k \neq -3$

C. $k = 3$

D. $k \neq 3$

Answer:



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3. An equation whose degree is one is equation.

A. Linear

B. Quadratic

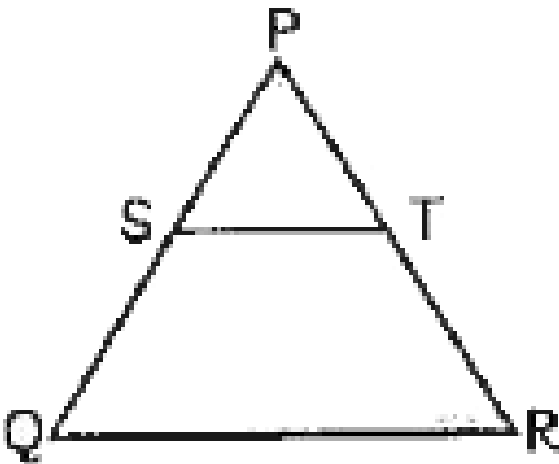
C. Cubic

D. Both (a) and (b)

Answer:

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4. In the figure below, $ST \parallel QR$, $\frac{PS}{SQ} = \frac{3}{5}$ and $PR = 28$ cm. What is the value of PT ?



A. 12.5 cm

B. 17.5 cm

C. 10.5 cm

D. 13.5 cm

Answer:



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5. The rational number $\frac{127}{2^2 \times 5^3}$ is a

A. Terminating

B. Non-terminating

C. Non-terminating and replating

D. Non-terminating and non-replating

Answer:



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6. If in a triangle, a line divides any two sides of a triangle in the same ratio, then that line is to the third side.

- A. parallel
- B. perpendicular
- C. equal
- D. can't decide

Answer:



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7. What are the value(s) of y , if the points $A(-1, y)$ and $B(5, 7)$ lie on a circle with centre $O(2, -3y)$.

- A. 7, 3
- B. -1, 7
- C. 1, 7

D. 7, 2

Answer:



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8. On choosing a number x from the numbers 1, 2, 3 and a number y from the numbers 1, 4, 9, the probability of $P(xy < 9)$ is:

A. $\frac{5}{9}$

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

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

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

Answer:



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9. If $12x + 17y = 53$ and $17x + 12y = 63$ then find the values of $(x + y)$

A. 4

B. 6

C. 8

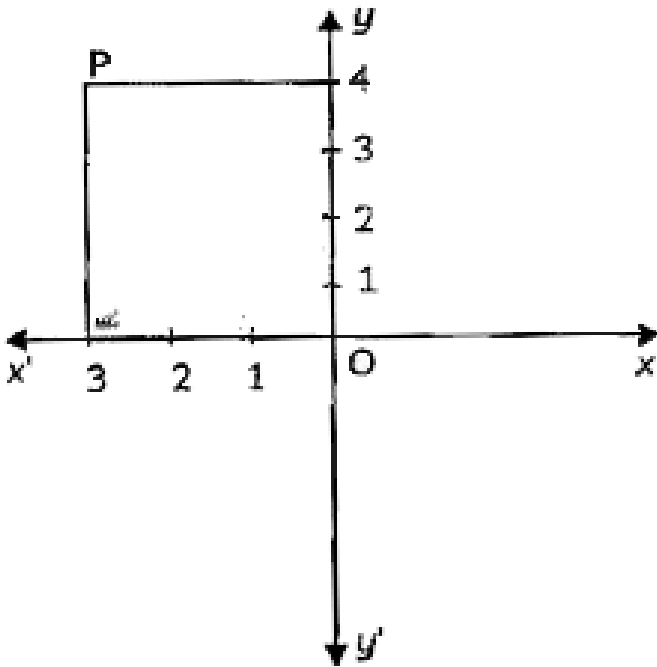
D. -4

Answer:



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10. What is the distance of the point P from the x-axis, shown on the grid?

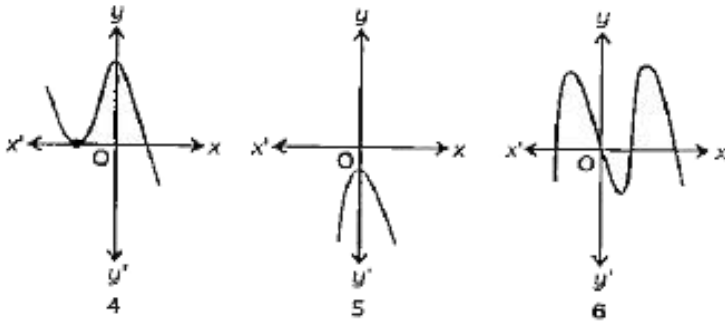
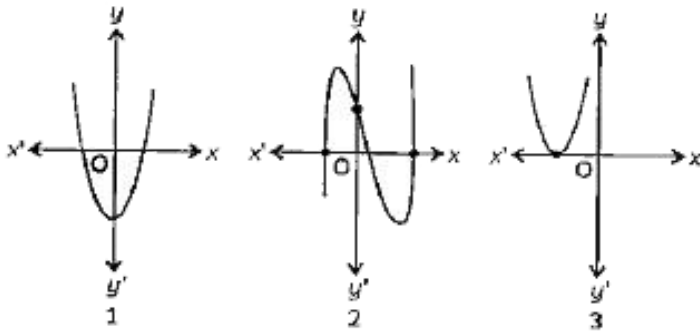


- A. 4
- B. -4
- C. 3
- D. -3

Answer:

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11..



Which of the above graph represent quadratic polynomials?

- A. 1 and 3
- B. 1, 3 and 5
- C. Only 5
- D. Only 6

Answer:



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12. A box contains 40 pens out of which x are non-defective. If one pen is drawn at random, the probability of drawing a non-defective pen is y . If we replace the pen drawn and then add 20 more non-defective pens in this bag the probability of drawing a non-defective pen is $4y$. Then, evaluate the value of x .

A. 4

B. 7

C. 6

D. 2

Answer:



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13. Evaluate ab , if $a = \sec \theta - \tan \theta$ and $b = \sec \theta + \tan \theta$.

A. 0

B. -1

C. 1

D. 2

Answer:



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14. The perimeter of two similar triangles ABC and LMN are 60cm and 48cm respectively. If $LM = 8\text{cm}$, then what is the length AB ?

A. 10 cm

B. 12 cm

C. 6 cm

D. 14 cm

Answer:



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15. HCF of two numbers a and b is 6 and their LCM is 60. Then, product of ab is:

A. 240

B. 180

C. 225

D. 360

Answer:



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16. For what value(s) of x , the distance between the points $P(2, -3)$ and $Q(x, 5)$ is 10 units?

A. 9, 2

B. -4, 8

C. 10, 1

D. 6, 3

Answer:



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17. What is the probability of getting a consonant, when a letter of English alphabet is chosen at random?

A. $\frac{5}{26}$

B. $\frac{21}{26}$

C. $\frac{19}{26}$

D. $\frac{17}{26}$

Answer:

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18. A line intersects the y-axis and x-axis at the points P and Q respectively.

If (2,-5) is the mid-point of PQ then find the coordinates of P and Q.

A. (0, -10)

B. (4, 0)

C. (10, 0)

D. (0, -4)

Answer:

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19. Find the value of x if $\frac{4 - \sin^2 45^\circ}{\cot x \cdot \tan 60^\circ} = 3.5$

A. 0°

B. 15°

C. 30°

D. 60°

Answer:



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20. Find the smallest number which when increased by 17 is exactly divisible by both 520 and 468.

A. 4680

B. 4663

C. 4581

D. 4682

Answer:



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1. Consider two numbers, whose HCF and LCM are 33 and 264 respectively. The first number is completely divisible by 2 and gives quotient 33. What is the other number?

- A. 66
- B. 132
- C. 58
- D. 73

Answer:



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2. The pair of equations $x = 0$ and $x = -2$ have

- A. One solution

B. Two solution

C. Infinitely many solution

D. No solution

Answer:



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3. Write the distance between the points $A(10 \cos \theta, 0)$ and $B(0, 10 \sin \theta)$.

A. 15 units

B. 10 units

C. 20 units

D. 1 unit

Answer:



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4. Find the value of $\sin 2\theta_1 + \tan 3\theta_2$, if $\tan(\theta_1 + \theta_2) = \sqrt{3}$ and $\sec(\theta_1 - \theta_2) = \frac{2}{\sqrt{3}}$.

A. 2

B. 1

C. 0

D. -1

Answer:



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5. The solution of given pair of linear equations $2x + y = 2$ and $2y - x = 4$ is:

A. (0, 0)

B. (2, 0)

C. (0, 2)

D. (2, 2)

Answer:



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6. Find the value of θ , if $\sqrt{3} \tan 2\theta - 3 = 0$

A. 15°

B. 30°

C. 20°

D. 45°

Answer:



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7. On choosing a number randomly from the numbers: 1, 3, 4, 6, 7, 10, 8, 65, the probability that it is a prime number is:

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

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

C. $\frac{3}{5}$

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

Answer:



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8. On a sunny afternoon, Sam and Ram were sitting idle and getting bored. So they started playing a game with a pair of dice that one of them had. Each of them started rolling the pair of dice one by one, stating one condition before rolling. If the person gets the numbers according to the condition stated by him, he wins and get a score.



First friend says, "a doublet". Then, his probability of winning is:

A. $\frac{1}{6}$

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

C. $\frac{5}{6}$

D. $\frac{5}{18}$

Answer:



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9. The ratio of areas of two similar triangles is 4:9. Then, the ratio of their sides is:

A. 2:3

B. 3 : 2

C. $\sqrt{3} : \sqrt{2}$

D. $\sqrt{2} : \sqrt{3}$

Answer:



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10. Find the LCM of smallest prime number and smallest composite number.

A. 12

B. 10

C. 2

D. 4

Answer:

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11. The value of C for which the pairs of equation $cx - y = 2$ and $6x - 2y = 4$ will have infinite many solutions.

A. 3

B. 5

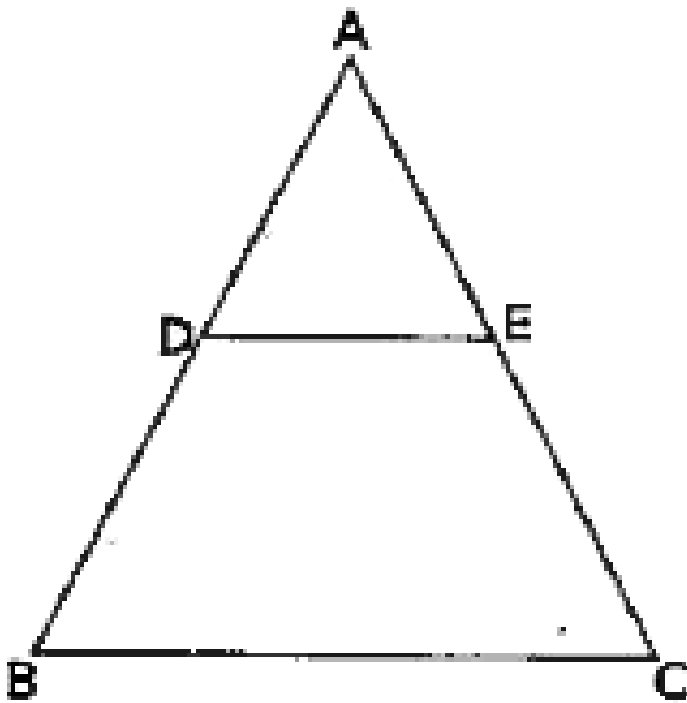
C. -1

D. 0

Answer:

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12. In $\triangle ABC$, when $DE \parallel BC$ and $AD = x$, $DB = 3x + 4$, $AE = x + 3$ and $EC = 3x + 19$ then value of x is:



- A. 4 units
- B. 6 units
- C. 3 units
- D. 2 units

Answer:

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13. Evaluate the coordinates of the point which divides the line segment joining the points (8, -9) and (2, 3) internally in the ratio 1: 2.

A. (6, -5)

B. (5, 5)

C. (1, -4)

D. (2, 3)

Answer:



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14. A right triangle has hypotenuse of length p cm and one side of length q cm . If $p - q = 1$, find the length of the third side of the triangle.

A. $2pq$

B. $\sqrt{p + q}$

C. $\sqrt{p^2 + q^2}$

D. $\sqrt{2pq}$

Answer:



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15. Find the value of y , from the equations $x - y = 0.9$ and $\frac{11}{x + y} = 2$.

A. 1.2

B. 2.1

C. 3.2

D. 2.3

Answer:



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16. Find the distance $2AB$, where A and B are the points $(-6, 7)$ and $(-1, -5)$ respectively.

- A. 28 units
- B. 24 units
- C. 25 units
- D. 26 units

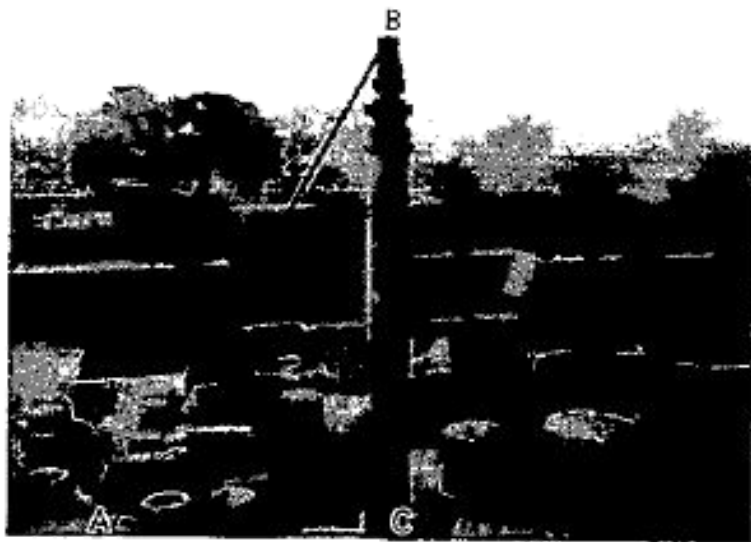
Answer:



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17. Pillars of Ashoka are a series of columns in Indian subcontinent. One of the Pillars of Ashoka is located in Vaishali having a single lion capital and another inside the Allahabad Fort, known as Allahabad pillar or Ashoka Stambha, shown as BC in the figure below. The point A is taken on the ground such that $\triangle ABC$ forms a right-angled triangle. If $\sin(A + B) = 1$ and $\sin(A - B) = \frac{1}{2}$, $0^\circ \leq A - B \leq 90^\circ$, $A > B$, the values of A and B

are:



A. $A = 30^\circ$, $B = 60^\circ$

B. $A = 45^\circ$, $B = 45^\circ$

C. $A = 60^\circ$, $B = 30^\circ$

D. $A = 45^\circ$, $B = 30^\circ$

Answer:



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18. Ratio of areas of two similar triangles are

- A. Their altitudes have a ratio $a : b$.
- B. Their medians have a ratio $\frac{a}{2} : b$.
- C. Their angle bisectors have a ratio $a^2 : b^2$
- D. The ratio of their perimeters is $3a : b$.

Answer:



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19. Evaluate one zero of $p(x) = ax^2 + bx + c$ and $a + b + c = 0$.

- A. 0
- B. 2
- C. 1
- D. -1

Answer:

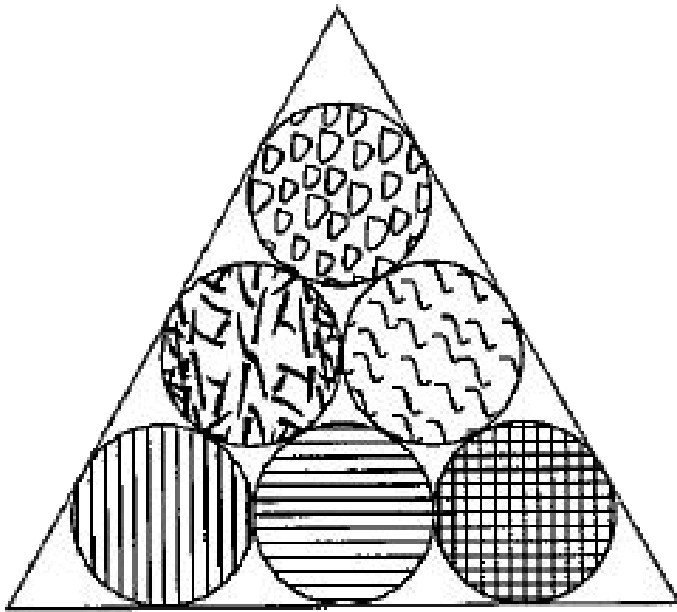


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Section C

1. Case Study-1:

Due to covid-19 lockdown, Ramesh decides to redo his house garden with some plantation work with his son. They have an equilateral triangle shaped garden and he has planted the garden with 6 different types of flowers (each of radius 1 m within a circular area). This left the remaining part of garden (that is outside the circular plants area) with lush green grass.



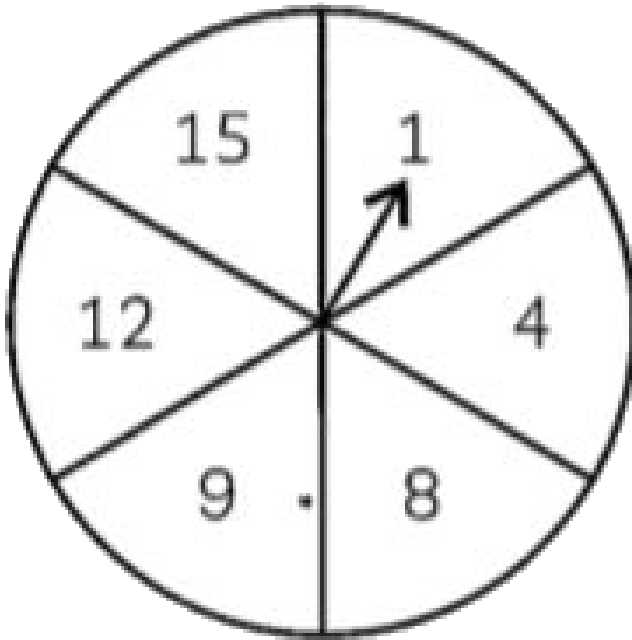
Now, comes the part of adding boundaries to corner the garden off nicely and he needs to know some calculations for it.

A boundary wall of height 25 cm is to be made around the garden leaving a space of 1 m wide for a gate on one side. The total length of boundary wall is

- A. 18 m
- B. 20 m
- C. 21 m
- D. 22 m

Answer:

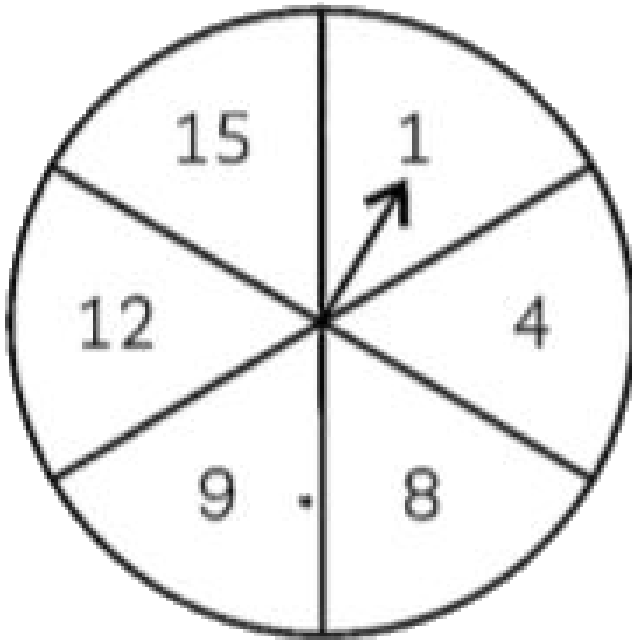
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2.

What is the probability of getting a number between 7 and 12 on the spinner?

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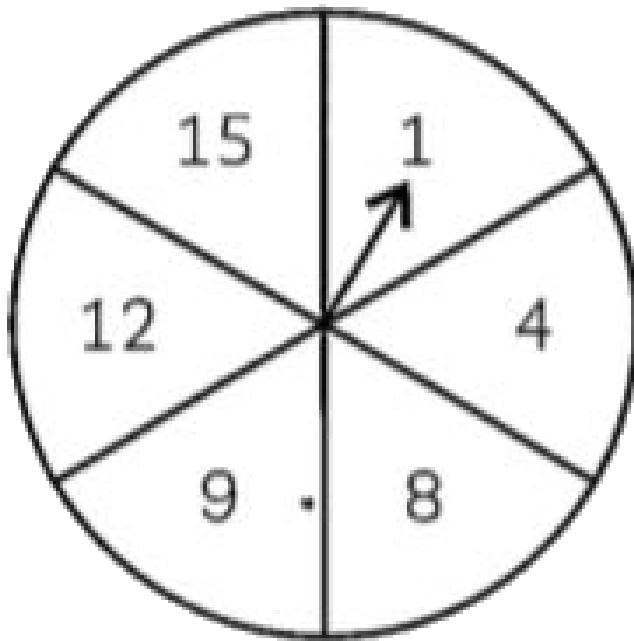


3.

What is the probability of getting a number less than 6 on the spinner?



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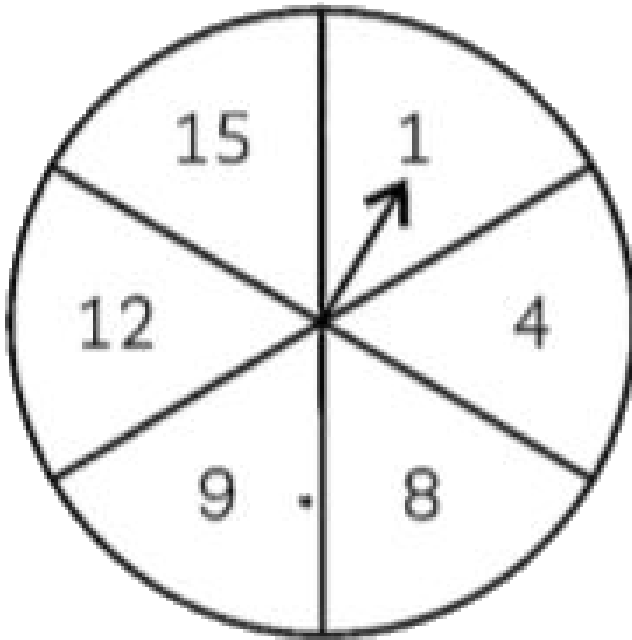


4.

What is the probability of getting a factor of 24 on the spinner?



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5.

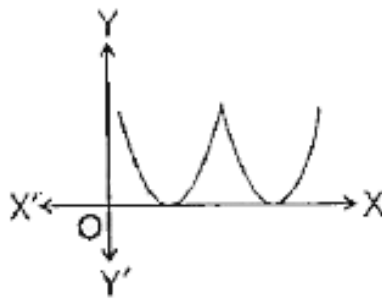
What is the probability of getting a multiple of 3 on the spinner?



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6. Case Study-2:

Radha decorated the door of her house with garlands on the occasion of Diwali. Each garland forms the shape of a parabola as shown in the figure.



What type of polynomial does the parabola formed by the garland represent?

- A. linear
- B. quadratic
- C. cubic
- D. None of these

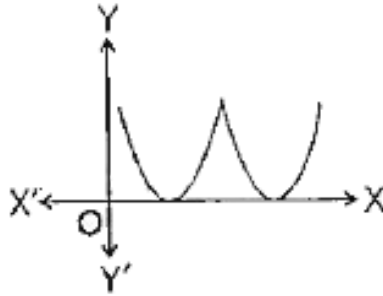
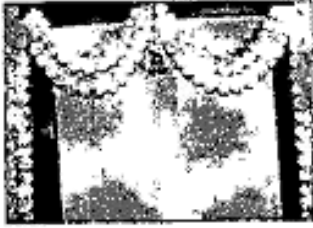
Answer:

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7. Case Study-2:

Radha decorated the door of her house with garlands on the occasion of

Diwali. Each garland forms the shape of a parabola as shown in the figure.



Evaluate the number of zeroes of a quadratic polynomial.

- A. more than 2
- B. atmost 2
- C. less than 2
- D. equal to 2

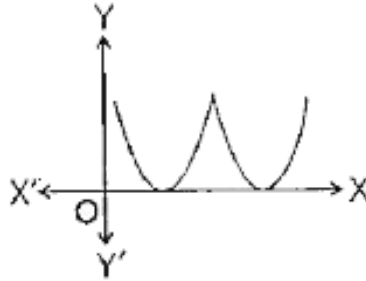
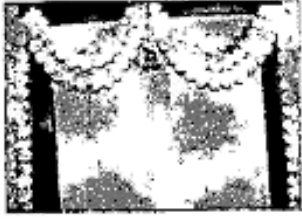
Answer:

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8. Case Study-2:

Radha decorated the door of her house with garlands on the occasion of

Diwali. Each garland forms the shape of a parabola as shown in the figure.



A quadratic polynomial with the sum and product of its zeroes as 1 and -2 respectively, is:

A. $x^2 + x - 2$

B. $x^2 - x - 2$

C. $x^2 + 2x - 1$

D. $x^2 - 2x - 1$

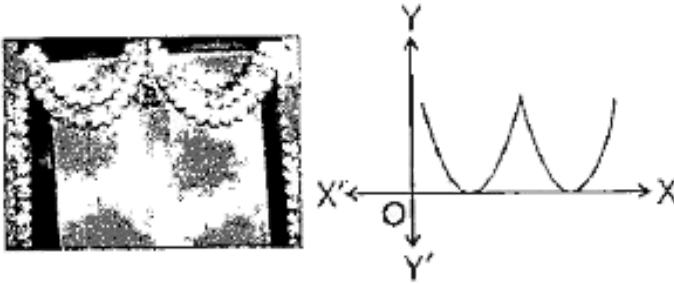
Answer:



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9. Case Study-2:

Radha decorated the door of her house with garlands on the occasion of Diwali. Each garland forms the shape of a parabola as shown in the figure.



What is the value of k , if one of the zeroes of the quadratic polynomial $(k - 2)x^2 - 2x - 5$ is -1 ?

- A. 5
- B. 3
- C. -5
- D. 0

Answer:



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10. If α, β are the zeroes of the polynomial $f(x) = x^2 - 7x + 12$, then find the value of $\frac{1}{\alpha} + \frac{1}{\beta}$.

A. 12

B. $(-7)(12)$

C. -7

D. $\frac{7}{12}$

Answer:



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Part A Section I

1. If the sum of the zeros of the polynomial $2x^2 + 3kx + 3$ is 6, then find the value of k .



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2. When a pair of linear equations is said to be inconsistent?

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3. Find the roots of the quadratic equation $(3x - 5)(x + 3) = 0$.

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4. Find the sum of natural numbers from 51 to 100.

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5. Find the 8^{th} term from the end of the A.P.— 12, -7 , -2 , ..., 68

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6. How many terms of AP: 18, 16, 14, ... make the sum zero?



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7. For what value of a is -4 zero of the polynomial

$$p(x) = x^2 - x - (2a + 2)?$$



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8. If $A(6, 2)$, $B(4, 2)$ and $C(6, 4)$ are the vertices of $\triangle ABC$, then find the length of the median through C .



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9. The base PQ of two equilateral triangles PQR and PQR with side $2a$ lies along y -axis such that the mid-point of PQ is at the origin. Find the coordinates of the vertices R and R of the triangles.



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10. In a $\triangle ABC$, if DE is parallel to BC, $\frac{AD}{DB} = \frac{3}{4}$ and AC = 15 cm, then find the length AE.

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11. If the bisector of an angle of a triangle bisects the opposite side, prove that the triangle is isosceles.

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

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13. Two concentric circles are of radii 5 cm. and 3 c. Find the length of the chord of the larger circle which touches the smaller circle.

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14. Write the area of a sector of angle θ (in degrees) of a circle with radius 'r'.

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15. If the perimeter of a semicircular protractor is 36cm, find its diameter.

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16. Determine the modal class for the frequency distribution given below is:

Class interval	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
Number of workers	15	18	21	29	17

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17. If $P(E) = 0.005$, then find the probability of "not E".

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18. The upper limit of the median class of the following frequency distribution.

Class	0 – 5	6 – 11	12 – 17	18 – 23	24 – 29
Frequency	13	10	15	8	11

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19. An unbiased die is rolled once. Find the probability of getting an even prime number.

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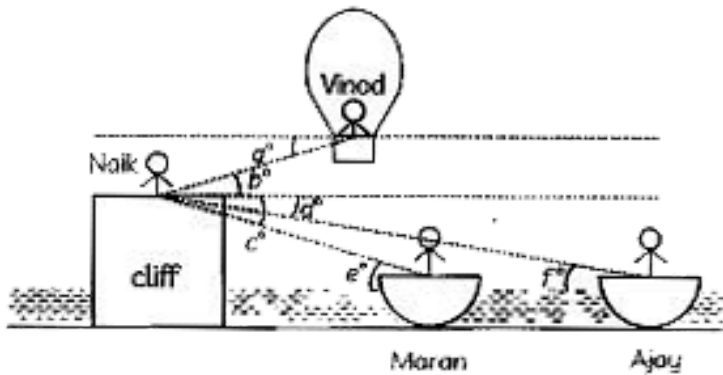
20. If $\sin B = 0.5$, find the value of $3 \cos B - 4 \cos^3 B$

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21. Find the value of $\cos^2 30^\circ \sin^2 45^\circ - \sec^2 60^\circ$

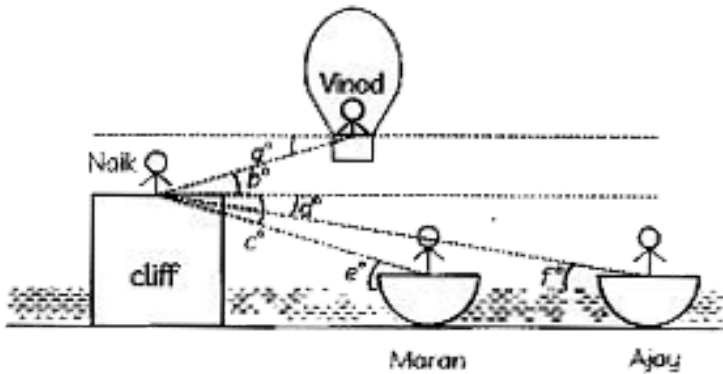


Part A Section II



1.

Which are the angles of elevation?



2.

Which are the angles of depression?

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3. An observer at a distance of 10 m from a tree looks at the top of the tree, the angle of elevation is 60° . What is the height of the tree? ($\sqrt{3} = 1.73$)

$\sqrt{3} = 1.73$)

- A. 17.5 m
- B. 12.26 m
- C. 14.45 m
- D. 15.4 m

Answer: C



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

A. 6.8 m

B. 8.5 m

C. 11.2 m

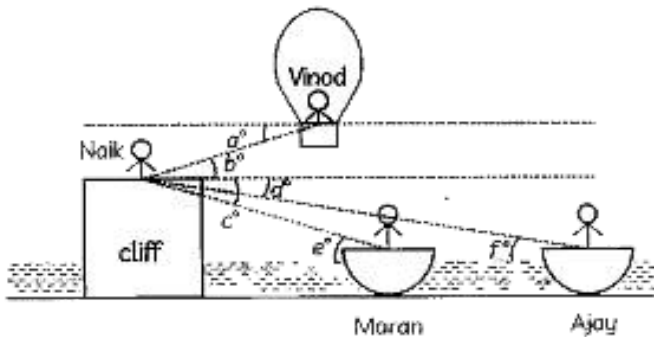
D. 21.9 m

Answer: D



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5. Mr. Naik is a paramilitary Intelligence Corps officer who is tasked with planning a coup on the enemy at a certain date. Currently he is inspecting the area standing on top of the cliff. Agent Vinod is on a hot air balloon in the sky. When Mr. Naik looks down below the cliff towards the sea, he has Ajay and Maran in boats positioned to get a good vantage point.



The main goal is to scope out the range and angles at which they should train their soldiers.

If the vertical height of the balloon from the top of the cliff is 12 m and $\angle b = 30^\circ$, then the distance between the Naik and vinod is

- A. 6 m
- B. 12 m
- C. 18 m

D. 24 m

Answer: D

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6. 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 $(x^2 + 2x + 1)$ by $(x + 1)$.

A. $x + 7$

B. $x - 3$

C. $x - 7$

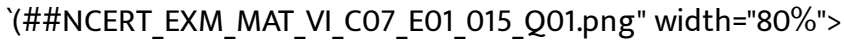
D. $x + 3$

Answer: C



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7. The perimeter of the triangle shown in figure. is



A. 12

B. 23

C. 47

D. 49

Answer: D



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8. The equation of a plane wave travelling along positive direction of x – axis is $y = a \sin \frac{2\pi}{\lambda}(vt - x)$ When the wave is reflected at a rigid surface

and its amplitude becomes 80 % , then find the equation of the reflected wave.

A. 1250

B. 2225

C. 2500

D. 2750

Answer: C



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9. Divide $3x^4 - 5x^3 - 2x^2 - 8x + 3$ by $x^2 + 5x + 3$



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10. The equation of a plane wave travelling along positive direction of x - axis is $y = a \sin \frac{2\pi}{\lambda}(vt - x)$ When the wave is reflected at a rigid

surface and its amplitude becomes 80 % , then find the equation of the reflected wave.

A. 49

B. 47

C. 44

D. 42

Answer: D



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11. 50 students of class IX planned a visit to an old age home and to spend the whole day with its inmates. Each one prepared a cylindrical flower vase using card board to gift the inmates. The radius of cylinder is 4.2 cm and the height is 11.2 cm.

What is the amount spent for purchasing the card board at the rate of 20 per $100m^2$.

A. ₹ 500

B. ₹ 750

C. ₹ 1000

D. ₹ 1250

Answer: C



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12. 50 students of class IX planned a visit to an old age home and to spend the whole day with its inmates. Each one prepared a cylindrical flower vase using card board to gift the inmates. The radius of cylinder is 4.2 cm and the height is 11.2 cm.

What is the amount spent for purchasing the card board at the rate of 20 per $100m^2$.

A. 20

B. 50

C. 54

D. 60

Answer: C



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13. Some friends pooled money to gift packs to senior citizens staying in old-age home. They pooled ₹ 3500. If each gift costs ₹ 70, how many senior citizens received gifts?

A. 35

B. 50

C. 54

D. 60

Answer: B



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14. Four friends Rohan, Amar, Saran and Madhukar decided to pool same money. They pooled money in the ratio 2 : 3 : 4 : 5. With the pooled money ₹ 3500. How much amount was pooled by Rohan and Madhukar together?

A. ₹ 1856

B. ₹ 1750

C. ₹ 1623

D. ₹ 2150

Answer: B



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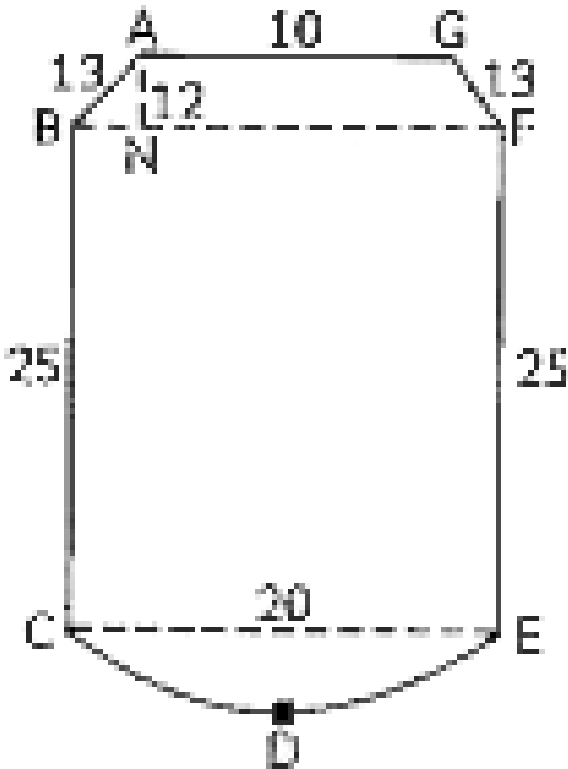
15. Four friends Rohan, Amar, Saran and Madhukar decided to pool same money. They pooled money in the ratio 2 : 3 : 4 : 5. With the pooled money ₹ 3500. How much amount was pooled by Amar?



16. Thermas Housewares Co. Ltd is one of the leading brands in the field of vacuum flask. They are producing a new high-quality heat preservation flask series and the below figure shows the cross - section of the interior part of a new concept thermos flask.

The top part is a trapezium, the middle part is a rectangle and the bottom part is a semi-circle





The dimension of various parts are:

$CE = 20$ cm, $BC = 25$ cm, $AB = GF = 13$ cm, $AG = 10$ cm and $AN = 12$ cm

The perimeter of the trapezium part of the cross section, is

A. 36 cm

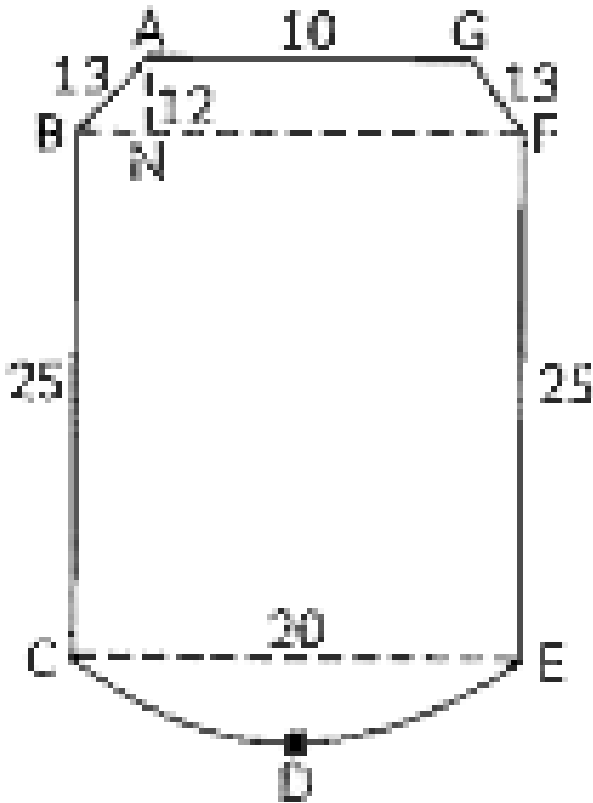
B. 56 cm

C. 30 cm

D. 46 cm

Answer: B

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17.

The dimension of various parts are:

CE = 20 cm, BC = 25 cm, AB = GF = 13 cm, AG = 10 cm and AN = 12 cm

The perimeter of the semi-circular part of the cross section, is

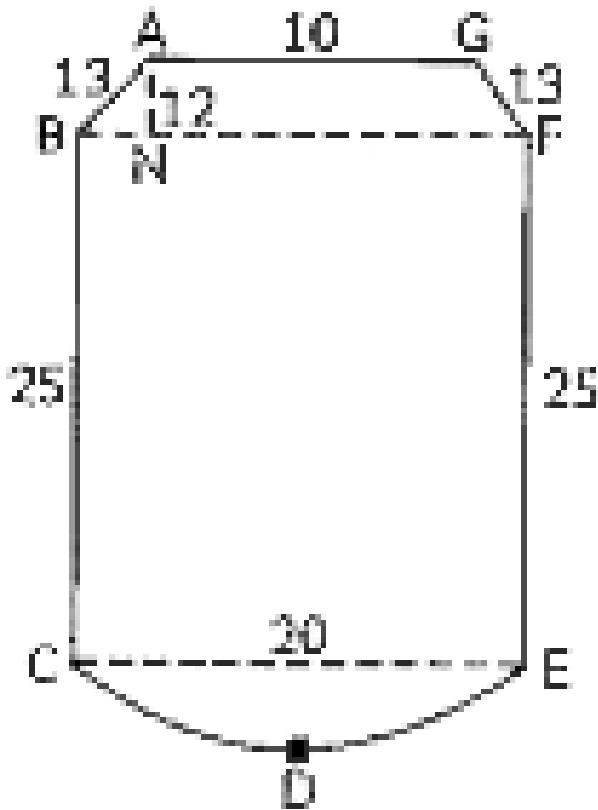
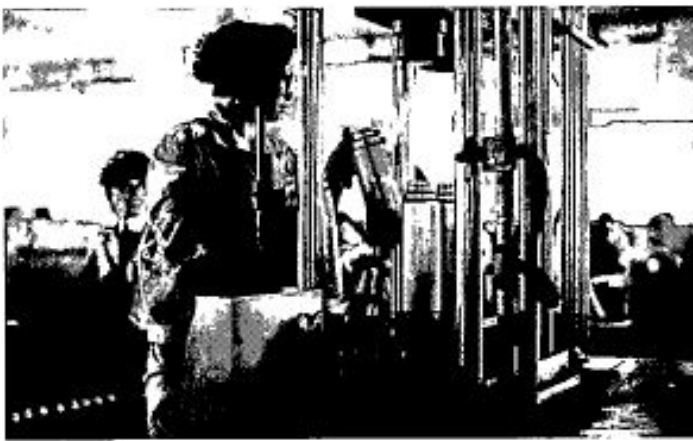
- A. π sq cm
- B. 10π sq cm
- C. 50π sq cm
- D. 100π sq cm

Answer: D

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18. Thermas Housewares Co. Ltd is one of the leading brands in the field of vacuum flask. They are producing a new high-quality heat preservation flask series and the below figure shows the cross - section of the interior part of a new concept thermos flask.

The top part is a trapezium, the middle part is a rectangle and the bottom part is a semi-circle



The dimension of various parts are:

CE = 20 cm, BC = 25 cm, AB = GF = 13 cm, AG = 10 cm and AN = 12 cm

The perimeter of the rectangular part of the cross section, is

A. 90 cm

B. 70 cm

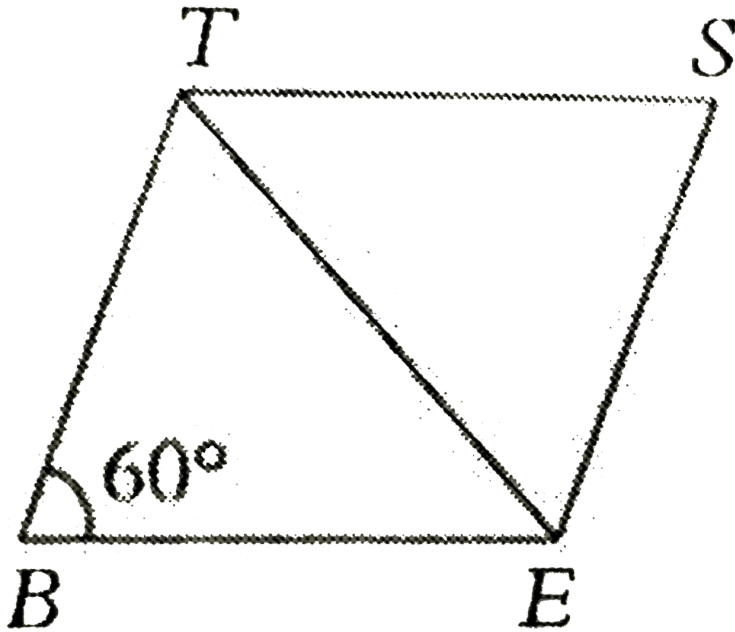
C. 50 cm

D. 40 cm

Answer: A



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19.

In a rhombus BEST, if $\angle B = 60^\circ$ and $BT = 6\text{cm}$, then find the length of the diagonal TE.

The following are the steps involved in solving the above problem.

Arrange them in sequential order.

(A) $\Rightarrow \Delta BTE$ is an equilateral triangle.

(B) Join T and E

(C) _____) In _____

$$\Delta BET, BT = BE \Rightarrow \angle BTE = \angle BET = \frac{180^\circ - 60^\circ}{2} = 60^\circ (\because \angle B = 60^\circ)$$

(D) $TE = 6\text{cm}$

A. 83 cm

B. 86 cm

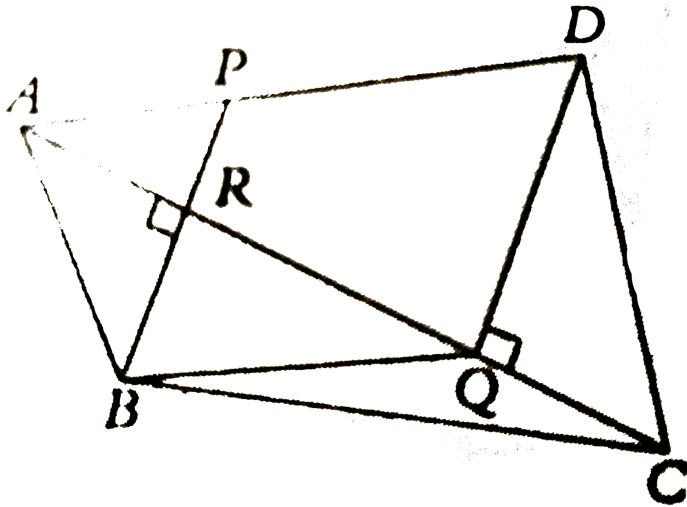
C. 117.4 cm

D. 130.4 cm

Answer: C



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20.

In the figure given above, ABCD is a quadrilateral and BPDQ is parallelogram. AR = 50 cm, CQ = 70 cm, BR = 60, and PR = 40 cm. If the area of the quadrilateral ABCD is $15,600\text{cm}^2$, then find the area of then find the area of the parallelogram BPDQ (in cm^2).

- A. 873 sq cm
- B. 738 sq cm
- C. 783 sq cm
- D. 837 sq cm

Answer: D



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Part B Section iii

1. Using prime factorisation, find the HCF and LCM of 150 and 240.



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2. Show that $3 + \sqrt{5}$ is an irrational number, assuming that $\sqrt{5}$ is an irrational number.



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3. What number should be added to the polynomial, $x^2 + 7x - 35$, so that 3 is the zero of the polynomial?



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4. Find the ratio in which the line segment joining the points $(-3, 10)$ and $(6, -8)$ is divided by $(-1, 6)$.

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5. Using distance formula, show that the points $A(1, -1)$, $B(5, 2)$ and $C(9, 5)$ are collinear.

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6. If $\frac{\cos \theta - \sin \theta}{\cos \theta + \sin \theta} = \frac{1 - \sqrt{3}}{1 + \sqrt{3}}$, then find the value of θ .

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7. Rasheed got a playing top (lattu) as his birthday present, which surprisingly had no colour on it. He wanted to colour it with his crayons.

The top is shaped like a cone surmounted by a hemisphere. The entire top is 5 cm in height and the diameter

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8. For the following frequency distribution, determine the mode and the median:

Class	100 – 120	120 – 140	140 – 160	160 – 180	180 – 200
Frequency	12	14	8	6	10

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Part B Section Iv

1. In an A.P., the last term is 28 and the sum of all the 9 terms of the A.P. is 144. Find the first term.

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2. In what ratio does the X -axis divide the line segment joining the points (-4,-6) and (-1,7) ? Find the coordinates of the points of division.

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

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4. The diagonal BD of a parallelogram ABCD intersects the segment AE at the point F, where E is any point on the Side BC. Prove that $DF \times EF = FB \times FA$.

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5. Draw a circle of radius 3 cm. Take a point P at a distance of 5 cm from the centre of the circle. From P, construct a pair of tangents to the circle.



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6. In the given figure, are shown two arcs PAQ and PBQ. Arc PAQ is a part of circle with centre O and radius OP while arc PBQ is a semi-circle drawn on PQ as diameter with centre M. $OP=PQ=10$ cm show that area of shaded region is $25\left(\sqrt{3} - \frac{\pi}{6}\right)cm^2$



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7. A Hollow cone is cut by a plane parallel to the base and upper portion is removed. If the curved surface of the remainder is $\frac{8}{9}$ of the curved surface of the whole cone; find the ration of the line-segment into which the cone's altitude is divided by the plane.



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8. 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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9. If the median of the following data is 32.5, find the missing frequencies.

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

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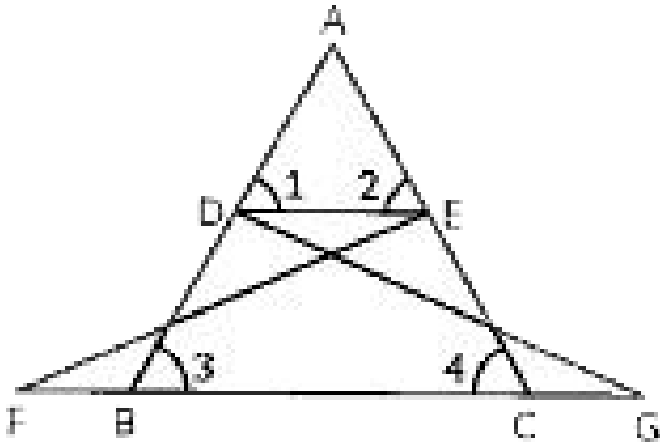
Part B Section V

1. A two digit number is four times the sum and three times the product of its digits.

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2. In the given figure, $\triangle FEC$ is congruent to $\triangle GDB$ and $\angle 1 = \angle 2$.

Prove that $\triangle ADE \sim \triangle ABC$



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3. If an isosceles triangle ABC in which $AB = AC = 6\text{cm}$ is inscribed in a circle of radius 9cm , find the area of the triangle.

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4. From an aeroplane vertically above a straight horizontal road, the angles of depression of two consecutive mile stones on opposite sides of the aeroplane are observed to be α and β . Show that the height in miles of aeroplane above the road is give by $\frac{\tan \alpha \tan \beta}{\tan \alpha + \tan \beta}$

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Section A

1. If the sum and product of zeroes of a polynomial are $-2, 3$ respectively, then the polynomial is

A. $x^2 - 2x + 3$

B. $x^2 + 2x - 3$

C. $x^2 + 2x + 3$

D. $x^2 - 2x - 3$

Answer:



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2. Evaluate: $5 + \frac{(1 + \tan^2 \theta) \sin \theta \cos \theta}{\tan \theta}$

A. 1

B. 5

C. -1

D. 6

Answer:



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3. Find the distance $2AB$, where A and B are the points $(-6, 7)$ and $(-1, -5)$ respectively.

A. 28 units

B. 24 units

C. 25 units

D. 26 units

Answer:

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4. For some integer q , every odd is of the form

A. m

B. $m + 1$

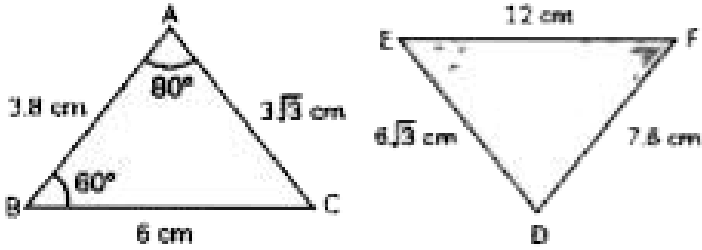
C. $2m$

D. $2m + 1$

Answer:

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5. What is the value of $\angle F$ in the given figure



- A. 60°
- B. 80°
- C. 40°
- D. 70°

Answer:

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6. Express R_3 in terms of R_1 and R_2 , where the sum of areas of two circles with radii R_1 and R_2 is equal to the area of the circle of radius R_3 .

A. $R_3^2 + R_2^2 + R_1^2$

B. $R_3^2 = R_1^2 - R_2^2$

C. $R_3^2 = R_1^2 + R_2^2$

D. $R_3^2 + R_1^2 = R_2^2$

Answer:



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7. Find the value of y , if the point $(5, y)$ divides the line segment joining $A(9, -1)$ and $B(3, -7)$ in the ratio $2:1$.

A. 5

B. -4.5

C. 6.5

D. 0

Answer:

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8. The condition on the polynomial $p(x) = ax^2 + bx + c$, $a \neq 0$, so that its zeroes are reciprocal of each other, is

A. $a=c$

B. $b=c$

C. $a = -b$

D. $a \neq b \neq c$

Answer:

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9. The total number of students in class X are 54, out of which there are 32 girls and rest are boys. The class teacher has to select one class representative. She writes the name of each student on a separate card

and put the cards in one bag. She randomly draw one card from the bag.

What is the probability that the name written on the card is of a girl?

A. $\frac{7}{27}$

B. $\frac{11}{27}$

C. $\frac{16}{27}$

D. $\frac{4}{27}$

Answer:



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10. After how many places, the decimal form of the number $\frac{27}{2^3 5^4 3^2}$ will terminate?

A. 1

B. 2

C. 3

D. 4

Answer:



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11. If any two sides of a triangle are divided by the line in the same ratio, then the line must be _____ to the third side of the triangle.

- A. parallel
- B. perpendicular
- C. equal
- D. half

Answer:



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12. Evaluate $\frac{y^2}{b^2} - \frac{x^2}{a^2}$, where $x = a \tan \theta$ and $y = b \sec \theta$

A. 0

B. 1

C. -1

D. 3

Answer:



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13. What is the area of the largest triangle that can be inscribed in a semicircle of radius r unit.

A. $\sqrt{2}r^2$ sq units

B. r^2 sq units

C. $\frac{1}{2}r^2$ sq units

D. $2r^2$ sq units

Answer:



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14. The HCF of 96 and 404 is

A. 4

B. 16

C. 8

D. 12

Answer:



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15. For a rational number $\frac{p}{q}$ to be terminating decimal, the denominator q must be of the form $2^m 5^n$, where m, n are

- A. Integers
- B. Natural numbers
- C. Positive integers
- D. Non-negative integers

Answer: B



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16. The value of $2\tan 45^\circ - \sec 60^\circ + \operatorname{cosec} 30^\circ$ is

- A. 5
- B. 4
- C. 3
- D. 2

Answer:



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17. $A(30, 20)$ and $B(6, -4)$ are two points. The coordinates of point P in AB such that $2PB = AP$ are:

A. $(14, 4)$

B. $(22, 9)$

C. $(14, -4)$

D. $(-22, 9)$

Answer:



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18. In $\triangle ABC$, right angled at B, if $AB=12\text{cm}$, $BC= x$ and $AC=13\text{cm}$, then the value of x is

A. 7

B. 5

C. -7

D. -5

Answer:



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19. Calculate the value of k , if $x=k$ is a solution of the quadratic polynomial

$$x^2 + 4x + 3.$$

A. 1

B. -1

C. 3

D. -4

Answer:

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20. If $A(3,4)$, $B(7, 9)$ and $C(x, 2)$ are the vertices of $\triangle ABC$ whose centroid is $G(4, y)$, then the value of x and y , respectively are:

A. 2,5

B. $-6, 15$

C. $-2, 7.5$

D. $\frac{14}{3}, \frac{15}{2}$

Answer:

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Section B

1. Find the least number which when divided by 15, leaves a remainder of 5, when divided by 25, leaves a remainder of 15 and when divided by 35

leaves a remainder of 25.

A. 515

B. 550

C. 530

D. 600

Answer:



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2. If the zeroes of the quadratic polynomial $x^2 + (a + 1)x + b$ are 2 and -3, then

A. -7, -1

B. 5, -1

C. 2, -6

D. 0, -6

Answer:



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3. Find the diameter of the wheel which covers a distance of 88km in 1000 revolutions.

A. 14m

B. 28m

C. 27m

D. 20m

Answer:



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4. If $\sin A + \sin^2 A = 1$, then the value of $\cos^2 A + \cos^4 A$ is 2 (b) 1 (c) -2
(d) 0

A. 1

B. 0

C. -1

D. ∞

Answer:

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5. What is value of $\alpha + \beta$, if $\tan \alpha = 1$ and $\sec \beta = \sqrt{2}$?

A. 0°

B. 30°

C. 45°

D. 90°

Answer:

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6. Determine the ratio in which the line $2x + y - 4 = 0$ divides the line segment joining the points A(2, 2) and B(3,7).

A. 4: 7

B. 3: 5

C. 2: 9

D. 5: 8

Answer:



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7. Find the length of each side of a rhombus whose diagonals are 24 cm and 10 m long.

A. 34cm

B. 26cm

C. 25cm

D. 13cm

Answer:



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8. In the equation shown below, a and b are unknown constants.

$$3ax + 4y = -2 \text{ and } 2x + by = 14$$

If $(-3, 4)$ is the solution of the given equations, find the value of ab .

A. 10

B. 6

C. 12

D. 15

Answer: A



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9. The value of $\frac{\sin \theta - 2 \sin^3 \theta}{2 \cos^3 \theta - \cos \theta}$ is

A. $\cot \theta$

B. $\tan \theta$

C. $\sec \theta$

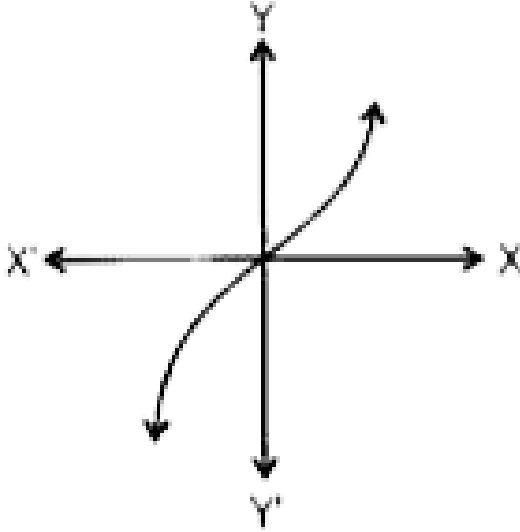
D. $\operatorname{cosec} \theta$

Answer:



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10. How many zeroes are there of $y = f(x)$ for the given graph?



A. 0

B. 1

C. 2

D. 3

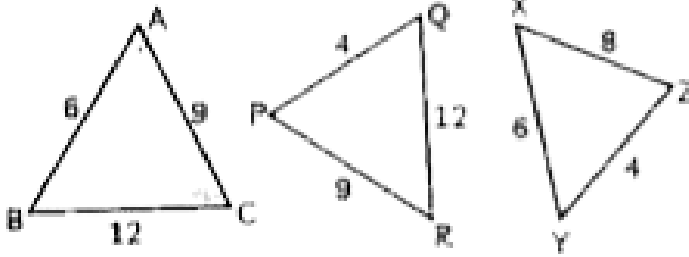
Answer: B



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11. In the given figure (not drawn to scale) three triangles are shown.

Which of the two triangles are similar ?



A. $\triangle ABC \sim \triangle XYZ$

B. $\triangle PQR \sim \triangle XYZ$

C. $\triangle ABC \sim \triangle YZX$

D. $\triangle QPR \sim \triangle BCA$

Answer: C



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12. If $\text{LCM}(25, 70) = 350$, then $\text{HCF}(25, 70)$ is

A. 10

B. 5

C. 11

D. 12

Answer:



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13. If the mid-point of the segment joining $A(x, y + 1)$ and $B(x + 1, y + 2)$ is $C\left(\frac{3}{2}, \frac{5}{2}\right)$, find x, y .

A. $-1, 0$

B. $1, 1$

C. $5, 3$

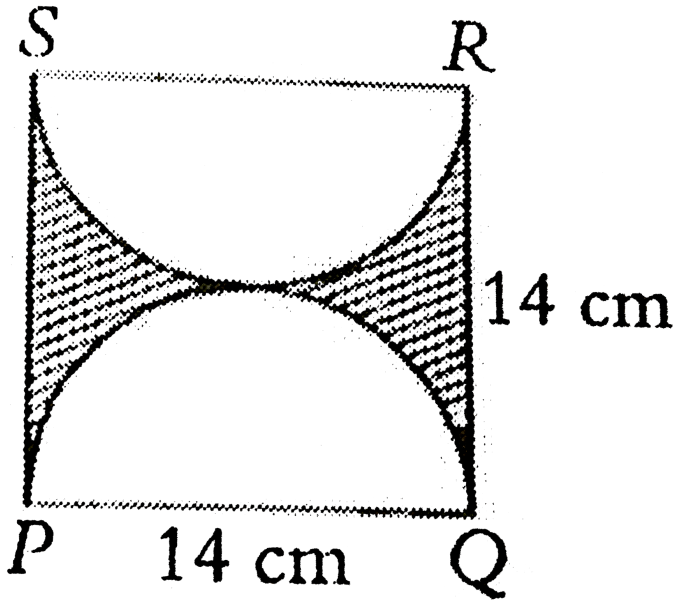
D. $3, 8$

Answer:



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14. In the figure given below, PQRS is a square of side 14 cm and two semicircles are drawn inside of it with PQ and SR as diameters. Find the area of the shaded region in the figure.



A. 38.71cm^2

B. 40cm^2

C. 36.82cm^2

D. 36cm^2

Answer:



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15. Evaluate for $\sin^{29} x + \cos ec^{29} x$, if $\sin x + \cos ecx = 2$.

A. 2

B. 0

C. 1

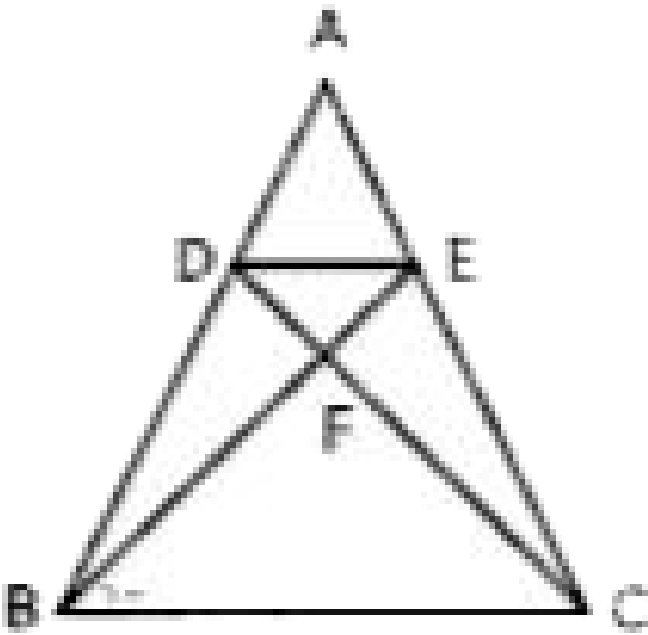
D. $\frac{1}{2}$

Answer: A



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16. In the figure, if $DE \parallel BC$ and $AD:AB = 5:9$, then the ratio of areas of $\triangle DEF$ and $\triangle BFC$ is



A. 5 : 4

B. 5 : 9

C. 25 : 81

D. 25 : 16

Answer: c



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17. A quadratic polynomial whose zeros are $\frac{3}{5}$ and $\frac{-1}{2}$, is

A. $x^2 - 9x + 6$

B. $10x^2 - x - 3$

C. $9x^2 + x + 6$

D. $7x^2 - 3x + 4$

Answer:



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18. The point on the x-axis which is equidistant from the points (7,6) and (-3, 4) is

A. (4,0)

B. (5,0)

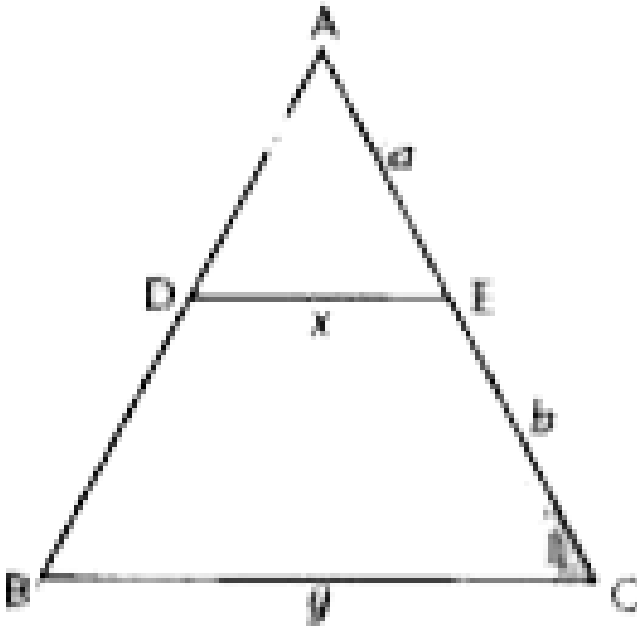
C. (3,0)

D. (-6, 0)

Answer:

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19. In the given figure, $DE \parallel BC$. Which of the following is true?



A. $x = \frac{a + b}{ay}$

B. $y = \frac{ax}{a + b}$

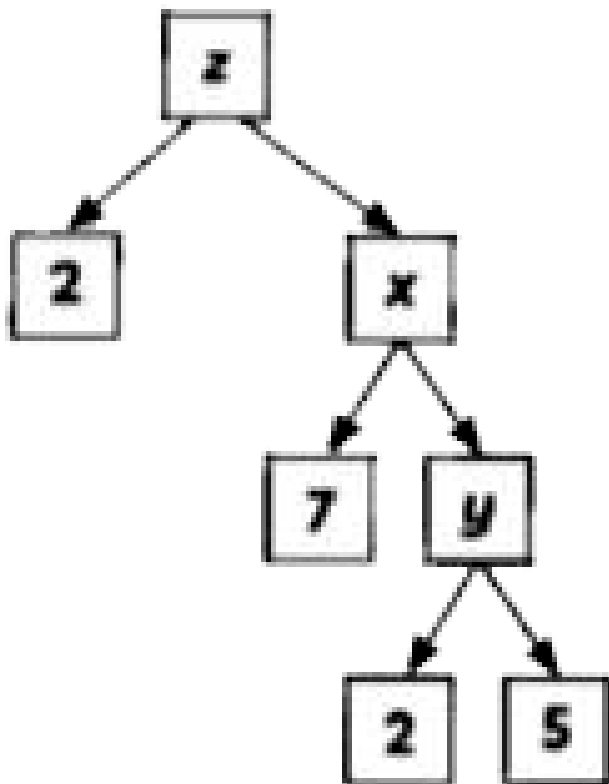
C. $x = \frac{ay}{a + b}$

$$D. \frac{x}{y} = \frac{a}{b}$$

Answer:

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20. From the following factor tree, $x : y : z$ is equal to



A. 7: 1: 14

B. 1: 7: 14

C. 7: 14: 1

D. 14: 1: 7

Answer:



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Section C Case Study Based Questions

1. For teaching the concept of probability, Mrs. Verma decided to use two dice. She took a pair of die and write all the possible outcomes on the blackboard. All possible outcomes were:



(1,1), (1,2), (1,3), (1,4), (1,5), (1,6)

(2,1), (2,2), (2,3), (2,4), (2,5), (2,6)

(3,1), (3,2), (3,3), (3,4), (3,5), (3,6)

(4,1), (4,2), (4,3), (4,4), (4,5), (4,6)

(5,1), (5,2), (5,3), (5,4), (5,5), (5,6)

(6,1), (6,2), (6,3), (6,4), (6,5), (6,6)

The probability that 4 will not come up on either of them is

A. $\frac{5}{18}$

B. $\frac{11}{36}$

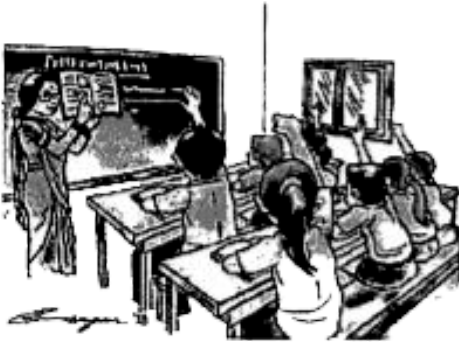
C. $\frac{25}{36}$

D. $\frac{6}{25}$

Answer:



2. For teaching the concept of probability, Mrs. Verma decided to use two dice. She took a pair of die and write all the possible outcomes on the blackboard. All possible outcomes were:



(1,1), (1,2), (1,3), (1,4), (1,5), (1,6)

(2,1), (2,2), (2,3), (2,4), (2,5), (2,6)

(3,1), (3,2), (3,3), (3,4), (3,5), (3,6)

(4,1), (4,2), (4,3), (4,4), (4,5), (4,6)

(5,1), (5,2), (5,3), (5,4), (5,5), (5,6)

(6,1), (6,2), (6,3), (6,4), (6,5), (6,6)

The probability that 5 will come up at least once is:

A. $\frac{13}{18}$

B. 0

C. $\frac{11}{36}$

D. $\frac{5}{18}$

Answer:



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3. For teaching the concept of probability, Mrs. Verma decided to use two dice. She took a pair of die and write all the possible outcomes on the blackboard. All possible outcomes were:



(1,1), (1,2), (1,3), (1,4), (1,5), (1,6)

(2,1), (2,2), (2,3), (2,4), (2,5), (2,6)

(3,1), (3,2), (3,3), (3,4), (3,5), (3,6)

(4,1), (4,2), (4,3), (4,4), (4,5), (4,6)

(5,1), (5,2), (5,3), (5,4), (5,5), (5,6)

(6,1), (6,2), (6,3), (6,4), (6,5), (6,6)

The probability that 6 will come up on both dice is

A. $\frac{1}{36}$

B. $\frac{5}{36}$

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

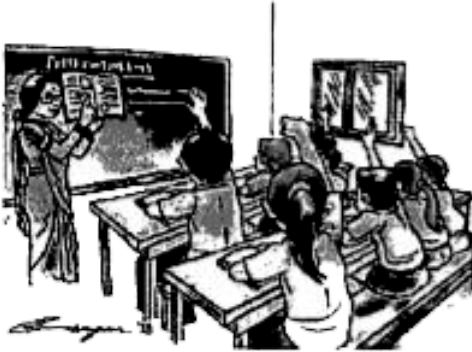
D. $\frac{1}{2}$

Answer:



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4. For teaching the concept of probability, Mrs. Verma decided to use two dice. She took a pair of die and write all the possible outcomes on the blackboard. All possible outcomes were:



(1,1), (1,2), (1,3), (1,4), (1,5), (1,6)

(2,1), (2,2), (2,3), (2,4), (2,5), (2,6)

(3,1), (3,2), (3,3), (3,4), (3,5), (3,6)

(4,1), (4,2), (4,3), (4,4), (4,5), (4,6)

(5,1), (5,2), (5,3), (5,4), (5,5), (5,6)

(6,1), (6,2), (6,3), (6,4), (6,5), (6,6)

The probability that both numbers comes up are even, is

A. $\frac{2}{3}$

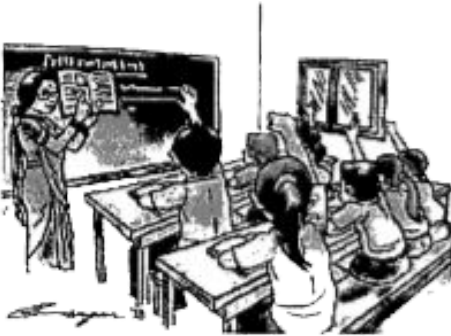
B. $\frac{1}{2}$

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

D. $\frac{3}{4}$

Answer:

5. For teaching the concept of probability, Mrs. Verma decided to use two dice. She took a pair of dice and wrote all the possible outcomes on the blackboard. All possible outcomes were:



(1,1), (1,2), (1,3), (1,4), (1,5), (1,6)

(2,1), (2,2), (2,3), (2,4), (2,5), (2,6)

(3,1), (3,2), (3,3), (3,4), (3,5), (3,6)

(4,1), (4,2), (4,3), (4,4), (4,5), (4,6)

(5,1), (5,2), (5,3), (5,4), (5,5), (5,6)

(6,1), (6,2), (6,3), (6,4), (6,5), (6,6)

The probability that both numbers come up as prime numbers, is

A. $\frac{3}{4}$

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

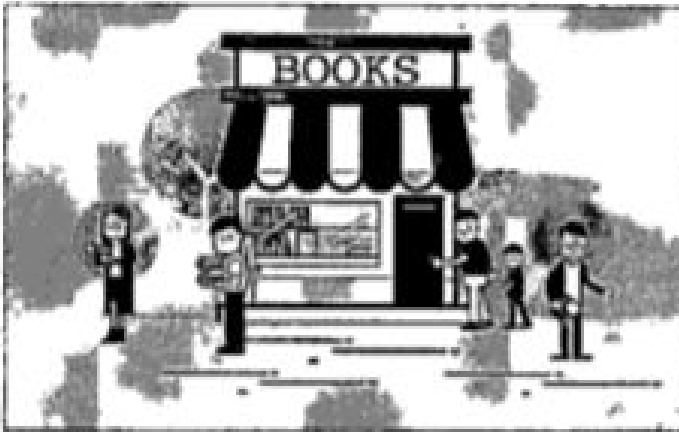
C. $\frac{2}{3}$

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

Answer:



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6.

A book store shopkeeper gives books on rent for reading. He has variety of books in his store related to fiction, story books, quiz books etc. He takes a fixed charges for the first two days and an additional charges for each day thereafter. Radhika paid Rs 22 for a book and kept for six days,

while Reshma paid Rs 16 when she kept for 4 days. Let the fixed charges be represented by Rs x and charges for each days be represented by Rs y .

Represent algebraically the situation of amount paid by Reshma

A. $x - 4y = 16$

B. $x + 4y = 16$

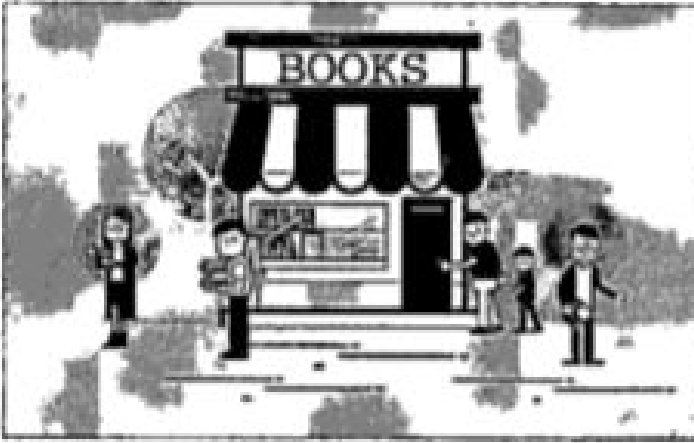
C. $x - 2y = 16$

D. $x + 2y = 16$

Answer:



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7.

A book store shopkeeper gives books on rent for reading. He has variety of books in his store related to fiction, story books, quiz books etc. He takes a fixed charges for the first two days and an additional charges for each day thereafter. Radhika paid Rs 22 for a book and kept for six days, while Reshma paid Rs 16 when she kept for 4 days. Let the fixed charges be represented by Rs x and charges for each days be represented by Rs y . Represent algebraically the situation of amount paid by Radhika.

A. $x - 2y = 11$

B. $x - 2y = 22$

C. $x + 4y = 22$

D. $x - 4y = 22$

Answer:



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8. A shopkeeper gives books on rent for reading. She takes a fixed charge for the first two days and an additional charge for each day thereafter. Latika paid Rs. 22 for a book kept for six days, while Anand paid Rs. 16 for the book kept for four days. Find the fixed charges and the charge for each extra day.

A. Rs 15

B. Rs 9

C. Rs 10

D. Rs 13

Answer:



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9. A shopkeeper gives books on rent for reading. She takes a fixed charge for the first two days and an additional charge for each day thereafter. Latika paid Rs. 22 for a book kept for six days, while Anand paid Rs. 16 for the book kept for four days. Find the fixed charges and the charge for each extra day.

A. Rs 4

B. Rs 3

C. Rs 5

D. Rs 6

Answer:



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10. A shopkeeper gives books on rent for reading. She takes a fixed charge for the first two days and an additional charge for each day thereafter. Latika paid Rs. 22 for a book kept for six days, while Anand paid Rs. 16 for

the book kept for four days. Find the fixed charges and the charge for each extra day.

A. Rs 35

B. Rs 52

C. Rs 50

D. Rs 58

Answer:



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