



MATHS

BOOKS - X BOARDS

CBSE BOARDS 2020

Section A

1. For the following frequency distribution .

Class	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25
Frequency	8	10	19	25	5

A. 15

B. 10

C. 20

D. 25

Answer:



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2. What is the probability of an impossible event?

A. 1

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

C. wt difined

D. 0

Answer:



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3. If $(3, -6)$ is the mid-point of the line segment joining $(0, 0)$ and (x, y) , then the point (x, y) is

A. $(-3, 6)$

B. $(6, 6)$

C. $(6, -12)$

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

Answer: C



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4. The discriminant of the quadratic equation $4x^2 - 6x + 3 = 0$ is

A. 12

B. 84

C. $2\sqrt{3}$

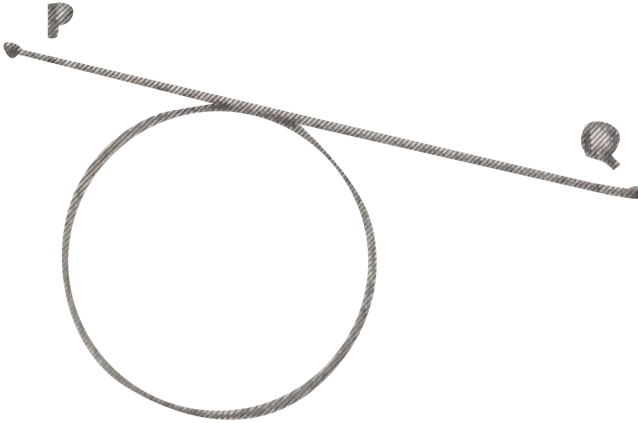
D. -12

Answer:



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5. In the given circle if Figure-1, number of tangents parallel to tangents PQ is



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6. $8 \cot^2 A - 8 \operatorname{cosec}^2 A$ is equal to

A. 8

B. $\frac{1}{8}$

C. -8

D. $-\frac{1}{8}$

Answer: C



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7. The point on x-axis which divides the line segment joining $(2, 3)$ and $(6, -9)$ in the ratio $1:3$ is

A. $(4, -3)$

B. $(6, 0)$

C. $(3, 0)$

D. $(0, 3)$

Answer: C



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8. If a pair of linear equations is consistent then the lines represented by them are

- A. parallel
- B. intersecting or coincident
- C. always coincident
- D. always intersecting.

Answer: B



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9. The total surface area of a frustum-shaped glass tumbler is ($r_1 > r_2$)

- A. $\pi r_1 l + \pi r_2 l$
- B. $\pi l(r_1 + r_2) + \pi r_2^2$
- C. $\frac{1}{3}\pi h r_1^2 + r_2^2 + r_1 r_2$
- D. $\sqrt{h^2 + (r_1 - r_2)^2}$

Answer:



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10. 120 can be expressed as a product of its prime factors as

A. $5 \times 8 \times 3$

B. 15×2^3

C. $10 \times 10^2 \times 3$

D. $5 \times 2^3 \times 3$

Answer:



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11. Area of quadrilateral ABCD = Area of $\triangle ABC$ + area of _____



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12. if the radii of two spheres are in the ratio 2: 3, then the ratio of their respective volumes is -----.

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13. If 2 is a zero of the polynomial $ax^2 - 2x$, then the value of a is _____

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14. A line intersecting a circle in two points is called a _____

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15. All squares are

A. congruent

B. similar

C. no similar and no congruent

D. none of these

Answer: B



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16. A dice is thrown once, If getting a six, is a success, then find the probability of a failure.



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17. Find the value of x so that $-6, x, 8$ are in AP

A. -2

B. -1

C. 2

D. 1

Answer: D



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18. Find the 11th term of the A.P. $-27, -22, -17, -12, \dots$

A. 24

B. 34

C. 23

D. 56

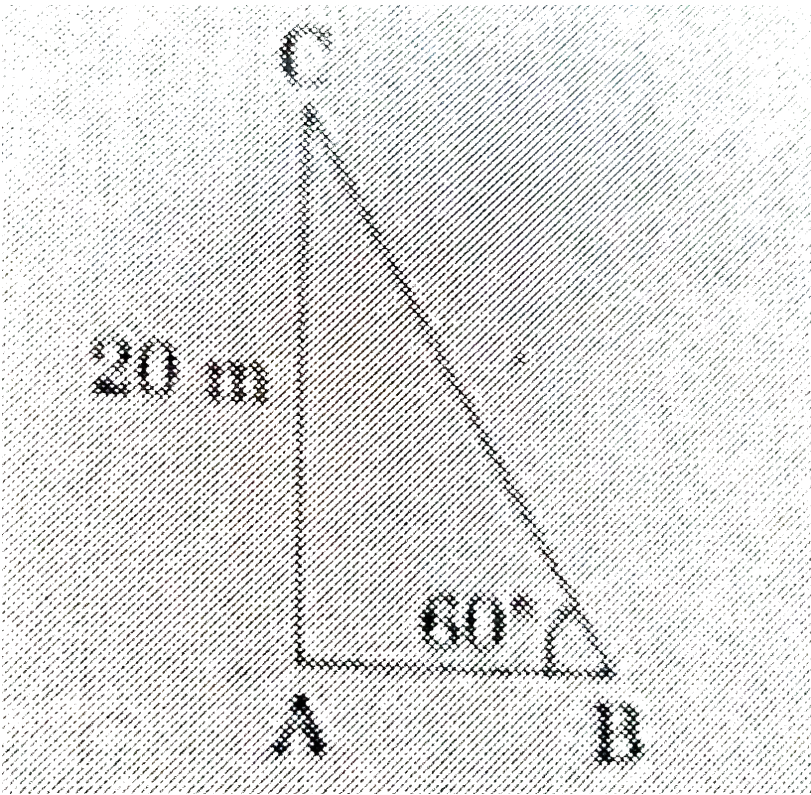
Answer: C



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19. In the figure-2, the angle of elevation of the top of tower AC from a point B on the ground is 60° . If the height of the tower is 20 m. find the

distance of the point from the foot of the tower.



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20. Evaluate :

$$\tan 40^\circ \times \tan 50^\circ$$

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21. If $\cos A = \sin 42^\circ$, then find the value of A.



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22. Find the height of a cone of radius 5 cm and slant height 13 cm.



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23. The value(s) of k for which the quadratic equation $2x^2 + kx + 2 = 0$ has equal roots, is

A. 4

B. ± 4

C. -4

D. 0

Answer:



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24. Which of the following is not an A.P?

A. $-1 \cdot 2, 0 \cdot 8, 2 \cdot 8, \dots$

B. $3, 3 + \sqrt{2}, 3 + 2\sqrt{2}, 3 + 3\sqrt{2}, \dots$

C. $\frac{4}{3}, \frac{7}{3}, \frac{9}{3}, \frac{12}{3}, \dots$

D. $\frac{-1}{5}, \frac{-2}{5}, \frac{-3}{5}, \dots$

Answer:



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25. The radius of a sphere (in cm) whose volume is $12\pi \text{ cm}^3$, is

(A) 3

(B) $3\sqrt{3}$

(C) $\frac{3^2}{3}$

(D) $\frac{3^1}{3}$

A. 3

B. $3\sqrt{3}$

C. $3^{2/3}$

D. $3^{1/3}$

Answer:



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26. The distance between the points $(m,-n)$ and $(-m,n)$ is

A. $\sqrt{m^2 + n^2}$

B. $m + n$

C. $2\sqrt{m^2 + n^2}$

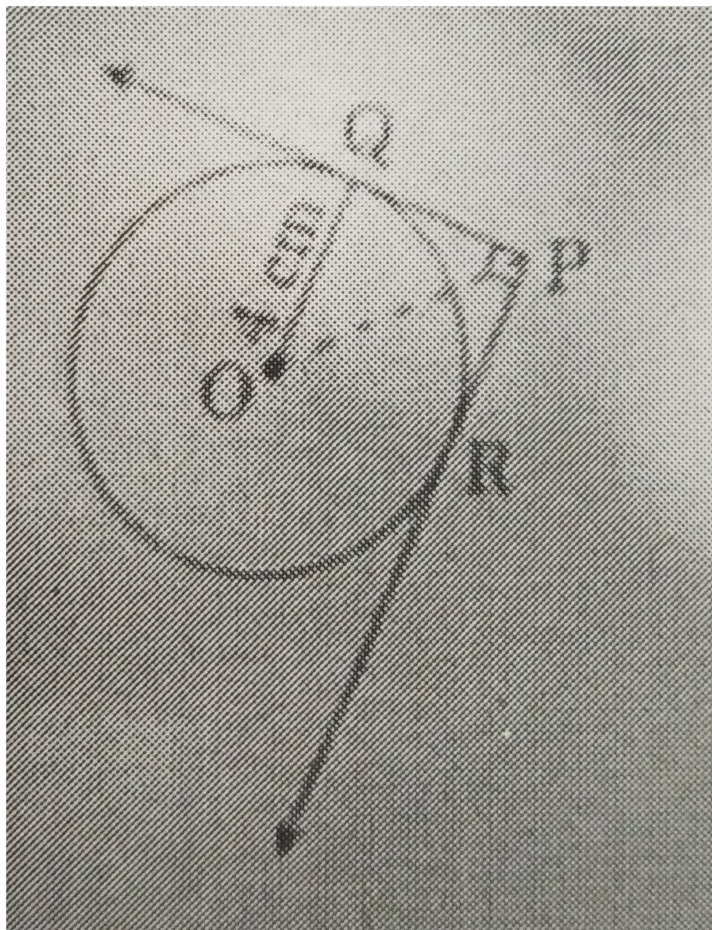
D. $\sqrt{2m^2 + 2n^2}$

Answer:



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27. If Figure-1, from an external point P, two tangents PQ and PR are drawn to a circle of radius 4 cm with centre O. if $\angle QPR = 90^\circ$, then length of PQ is



A. 3 cm

B. 4 cm

C. 2 cm

D. $2\sqrt{2}$ cm

Answer:



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28. On dividing a polynomial $p(x)$ by $x^2 - 4$, quotient and remainder are found to be x and 3 respectively. The polynomial $p(x)$ is

A. $3x^2 + x - 12$

B. $x^3 - 4x + 3$

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

D. $x^3 - 4x - 3$

Answer:



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29. In figure-2, $DE \parallel BC$. If $\frac{AD}{DB} = \frac{3}{2}$ and $AE = 2.7$ cm then EC is equal to

- A. 2.0 cm
- B. 1.8 cm
- C. 4.0 cm
- D. 2.7 cm

Answer: B



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30. The point on the axis which is equidistant from $(-4,0)$ and $(10,0)$ is ,

- a) $(7,0)$
- (b) $(5,0)$
- c) $(0,0)$
- d) $(3,0)$

A. (7,0)

B. (5,0)

C. (0,0)

D. (3,0)

Answer:



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31. The centre of a circle whose end points of a diameter are (-6,3) and

(6,4)

a) (8,-1)

b) (4,7)

c) $(0, \frac{7}{2})$

d) $(4, \frac{7}{2})$

A. (8,-1)

B. (4,7)

C. $\left(0, \frac{7}{2}\right)$

D. $\left(4, \frac{7}{2}\right)$

Answer:



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32. the pair of linear equations

$3x/2 + 5y/3 = 7$ and $9x + 10y = 14$ is

(a) consistent

(b) inconsistent

(c) consistent with one solution

(d) consistent with many solutions

A. consistent

B. inconsistent

C. consistent with one solution

D. consistent with many solutions

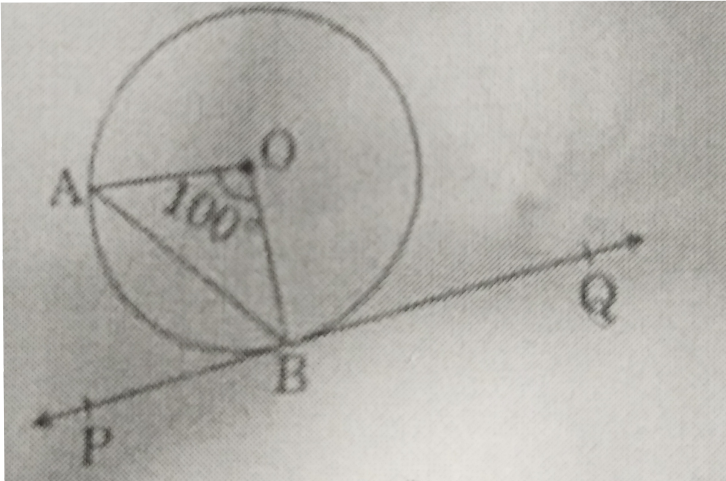
Answer:



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33. In figure-3, PQ is tangent to the circle with centre at O , at the point B .

if $\angle AOB = 100^\circ$, then $\angle ABP$ is equal to



A. 50°

B. 40°

C. 60°

D. 80°

Answer:

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34. Simplest form of $(1 + \tan^2 A) / (1 + \cot^2 A)$ IS

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35. If the probability of an event E happening is 0.023, then $P(\overline{E}) = \underline{\hspace{2cm}}$

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36. All concentric circles are..... to each other.

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37. The probability of an event that is sure to happen, is _____





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38. AOBC is a rectangle whose three vertices are A(0,-3), O(0,0) and B (4,0).

The length of its diagonal is __



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39. Write the value of $\sin^2 30^\circ + \cos^2 60^\circ$.



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40. Find a quadratic polynomial, the sum and product of whose zeroes are -3 and 2 , respectively.



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41. Can $(x^2 - 1)$ be a remainder while dividing $x^4 - 3x^2 + 5x - 9$ by $x^2 + 3$? justify your answer with reasons.



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42. Find the sum of the first 100 natural numbers.

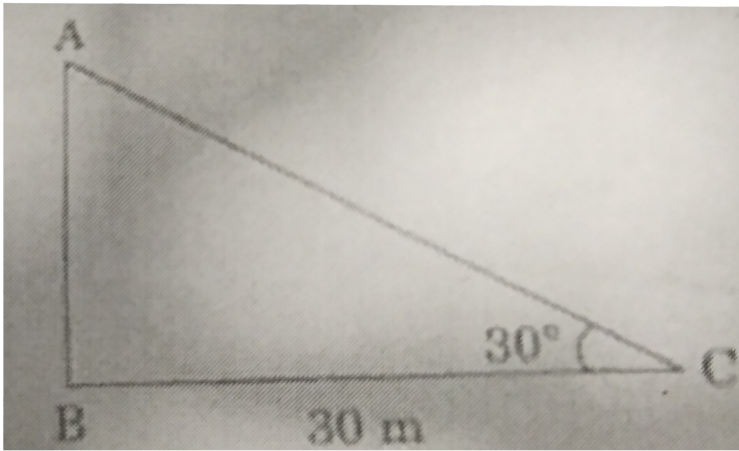


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43. The LCM of two numbers is 182 and their HCF is 13. If one of the numbers is 26, find the other.



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44.

If figure, the angle of 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.

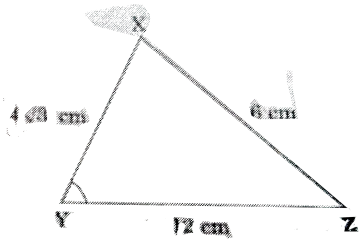
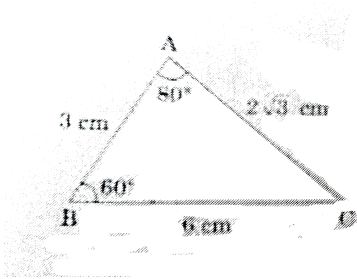


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Section B

1. In Figure 3, $\triangle ABC$ and $\triangle XYZ$ are shown. If $AB = 3\text{cm}$, $BC = 6\text{cm}$, $AC = 2\sqrt{3}\text{cm}$, $\angle A = 80^\circ$, $\angle B = 60^\circ$, $XY = 4\sqrt{3}$:

then find the value of $\angle Y$.



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2. Find the mean for the following distribution :

Classes :	5 - 15	15 - 25	25 - 35	35 - 45
Frequency :	2	4	3	1

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3. The following distribution shows the transport expenditure of 100 employees :

Expenditure in ₹ :	200 - 400	400 - 600	600 - 800	800 - 1000	1000 - 1200
Number of employees :	21	25	19	23	12



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4. Solve for x : $2x^2 + 5\sqrt{5}x - 15 = 0$



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5. Check whether 6^n can end with the digit 0 (zero) for any natural number n .



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6. If $5 \tan \theta = 4$, show that $\frac{5 \sin \theta - 3 \cos \theta}{5 \sin \theta + 3 \cos \theta} = \frac{1}{7}$



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7. 14 defective bulbs are accidentally mixed with 98 good ones. It is not possible to just look at the bulb and tell whether it is defective or not.

One bulb is taken out at random from this lot. Determine the probability that the bulb taken out is a good one.

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8. if $\tan(A + B) = \sqrt{3}$ and $\tan(A - B) = \frac{1}{\sqrt{3}}$,
 $0 < A + B \leq 90^\circ$, $A > B$, then find the values of A and B.

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9. If a letter is chosen at random from the English alphabet, find the probability that the letter chosen is (i) a vowel, and (ii) a consonant.

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10. Solve for x :

$$\sqrt{3}x^2 + 14x - 5\sqrt{3} = 0$$

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11. Find the mean for the following distribution :

Classes :	5 - 15	15 - 25	25 - 35	35 - 45
Frequency :	2	4	3	1

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12. The following distribution shows the transport expenditure of 100 employees :

Expenditure (in ₹) :	200 - 400	400 - 600	600 - 800	800 - 1000	1000 - 1200
Number of employees :	21	25	19	23	12

Find the mode of the distribution.

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

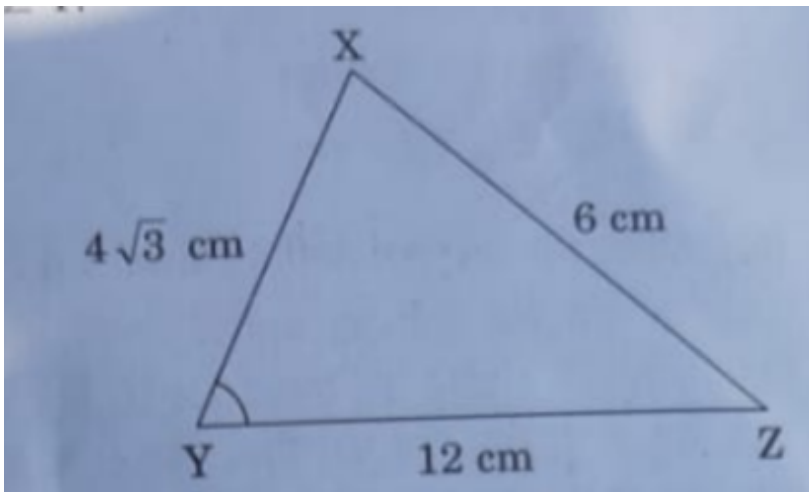
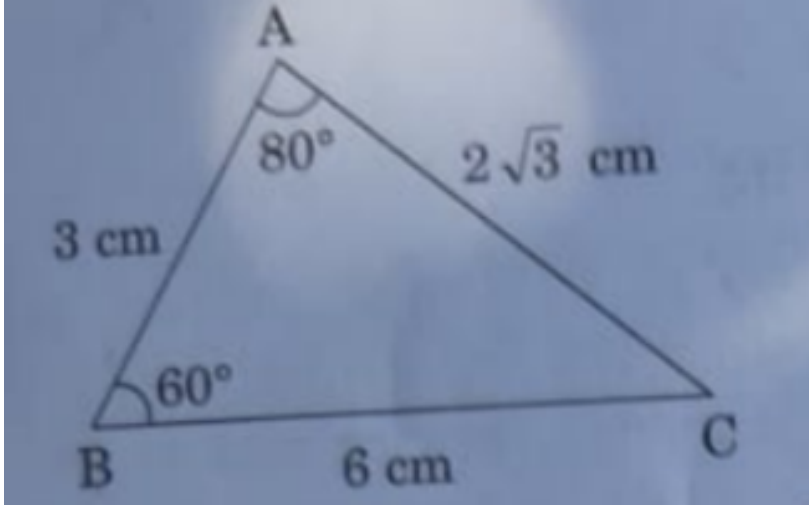
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14. Find the LCM of 150 and 200.



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15. In figure - 3, $\triangle ABC$ and $\triangle XYZ$ are shown. if $AB = 3$ CM, $BC = 6$ cm, $AC = 2\sqrt{3}$ cm , $\angle A = 80^\circ$, $\angle B = 60^\circ$, $XY = 4\sqrt{3}$ cm , $YZ = 12$ CM and $XZ = 6$ cm, then find the value of $\angle Y$



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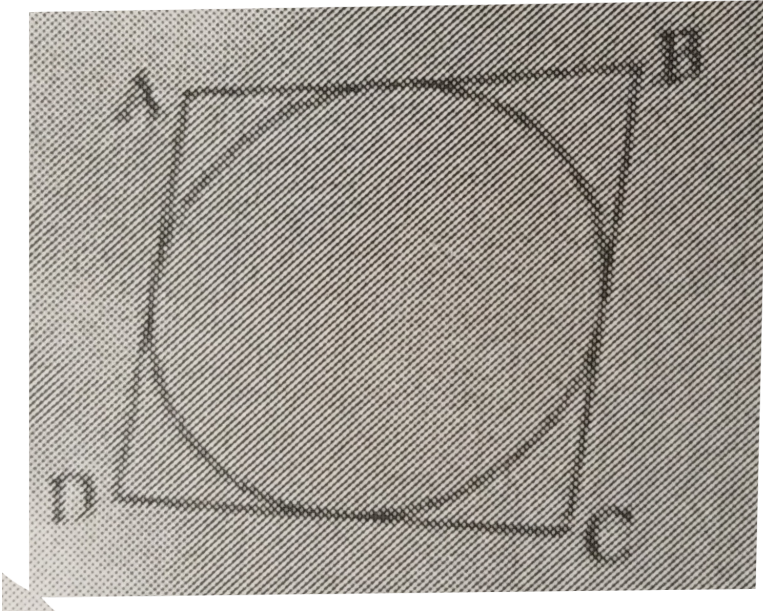
16. A cone and a cylinder have the same radii but the height of the cone is 3 times that of the cylinder. Find the ratio of their volumes.

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17. In Figure, a quadrilateral ABCD is drawn to circumscribe a circle .

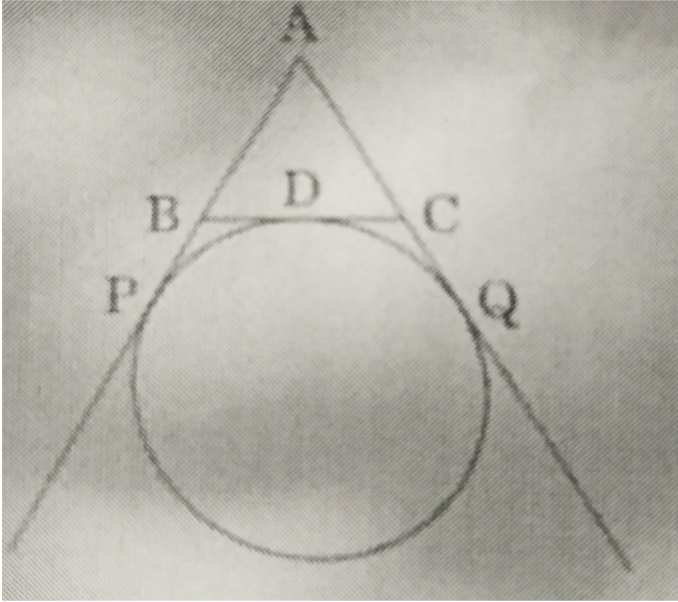
Prove that

$$AB + CD = BC + AD$$



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18. In Figure , find the perimeter of $\triangle ABC$. If $AP = 12$ cm.



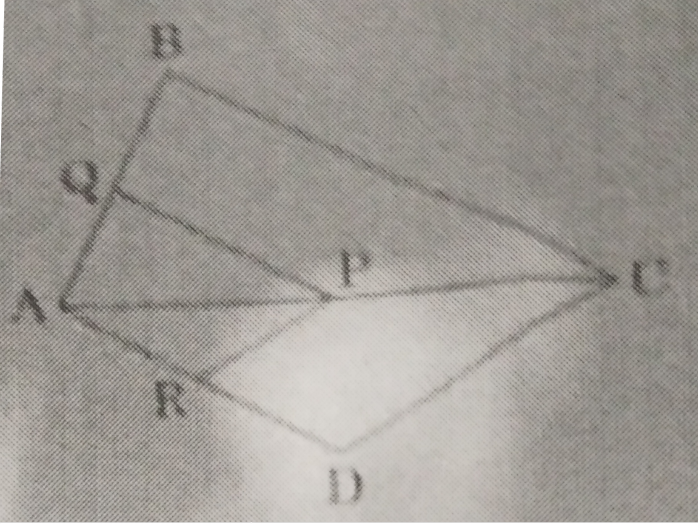
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19. Find the mode of the following distribution :

Marks :	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60
Number of Students :	4	6	7	12	5	6

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20. In Figure , If $PQ \parallel BC$ and $PR \parallel CD$, prove that $\frac{QB}{AQ} = \frac{DR}{AR}$.



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21. Show that $5+2\sqrt{7}$ is an irrational number, where $\sqrt{7}$ is given to be an irrational number.

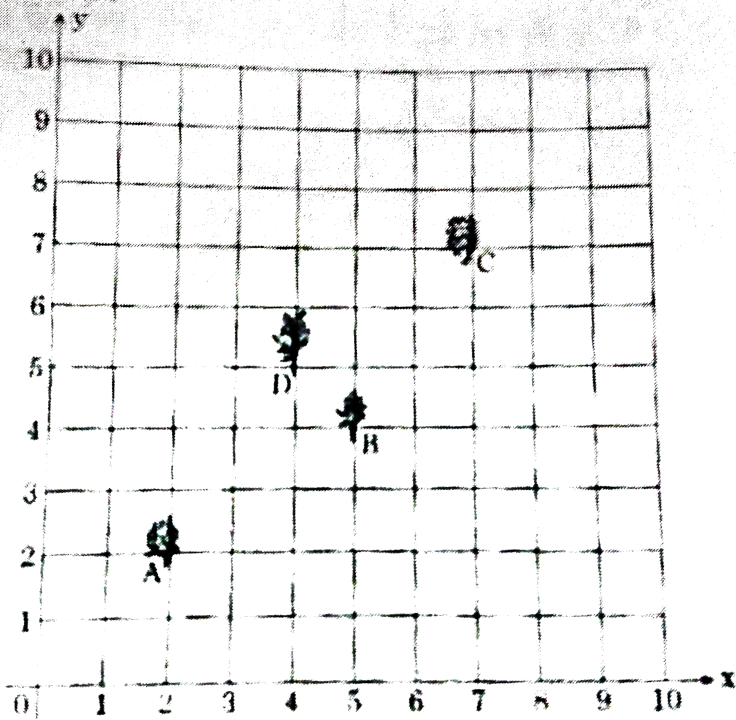
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22. Check whether 12^n can end with the digit 0 for any natural number n .

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Section C

1. Krishna has an apple orchard which has a $10m \times 10m$ sized kitchen garden attached to it. She divides it into a 10×10 grid and puts soil and manure into it. She grows a lemon plant at A, a coriander plant at B, an onion plant at C and a tomato plant at D. Her husband Ram praised her kitchen garden and points out that on joining A, B, C, and D they may form a parallelogram. Look at the below figure carefully and answer the following question.



(i) Write the coordinates of the points A, B, C and D using the 10×10 grid as coordinate axes.

(ii) Find whether ABCD is a parallelogram or not .

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

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3. Prove that :

$$\frac{\tan \theta}{1 - \cot \theta} + \frac{\cot \theta}{1 - \tan \theta} = 1 + \cos \theta \cos ec \theta$$



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4. दो सकेन्द्रीय वृत्तों की त्रिज्याएँ 5 cm तथा 3 cm दूरी पर हैं, बड़े वृत्त की उस जीवा की लंबाई ज्ञात कीजिए जो छोटे वृत्त को स्पर्श करती हो ।



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5. The difference between two numbers is 26 and the larger number exceeds thrice of the smaller number by 4. Find the numbers.

A. 38,12

B. 40,14

C. 37,11

D. none of these

Answer: C



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6. Solve for x and y :

$$\frac{2}{x} + \frac{3}{y} = 13, \frac{5}{x} - \frac{4}{y} = -2 (x \neq 0 \text{ and } y \neq 0)$$

A. (2, 3)

B. $\left(\frac{1}{2}, \frac{1}{3}\right)$

C. (4, 6)

D. $\left(\frac{1}{4}, \frac{1}{6}\right)$

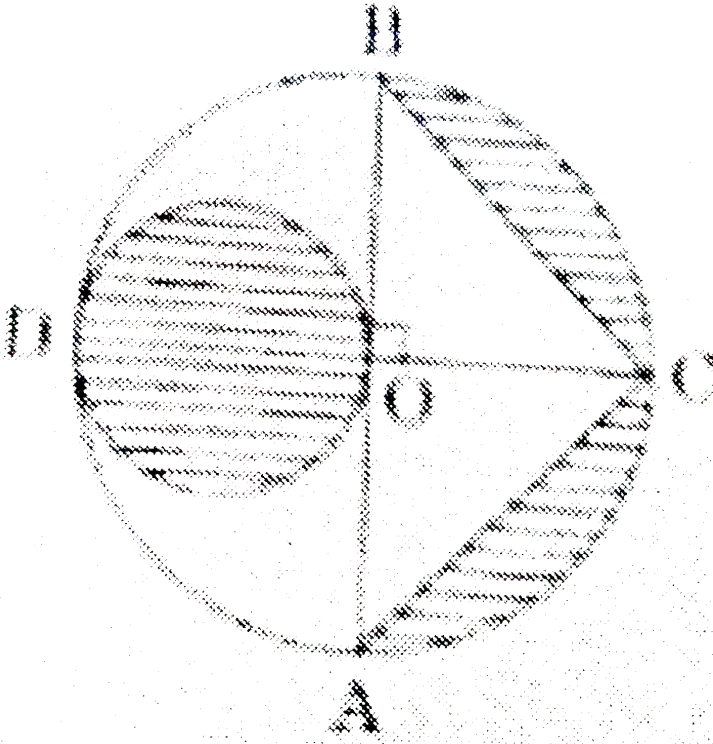
Answer: B



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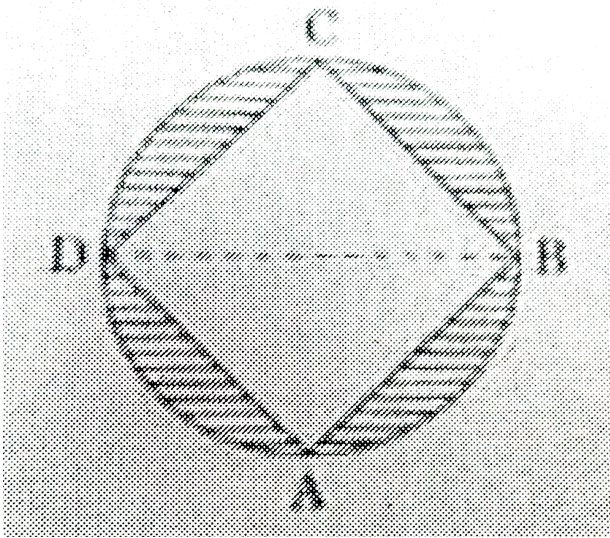
7. In Figure -4 AB, and CD are two diameters of a circle with centre O perpendicular to each other and OD is the diameter of the circle . If OA =

7 cm , then find the area of the shaded region .



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8. In Figure ABCD is a square with side 7 cm. A circle is drawn circumscribing the square . Find the area of the shaded region .



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9. Construct a triangle with its sides 4 cm, 5 cm and 6 cm. Then construct a triangle similar to it whose sides are $\frac{2}{3}$ of the corresponding sides of the first triangle.

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10. Draw a circle of radius 2.5 cm. Take a point P at a distance of 8 cm from its centre. Construct a pair of tangents from the point P to the circle.





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11. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the sum of first n terms.

A. n^2

B. n^3

C. $n^2 + 1$

D. $n^3 - 1$

Answer: A



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12. Construct a triangle of sides 4 cm, 5 cm and 6 cm and then a triangle similar to it where sides are $\frac{2}{3}$ of the corresponding sides of the first triangle.



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13. Draw a circle of radius 2.5cm. Take a point P at a distance of 8 cm from its centre. Construct a pair of tangents from the point P to the circle.



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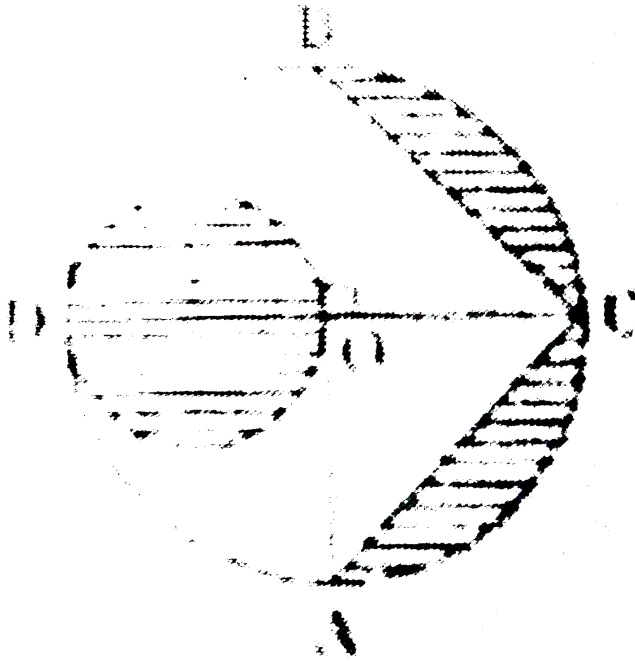
14. If the n^{th} terms of two A.P.s 23, 25, 27, And 5, 8, 11, 14,are equal, then find the value of n.



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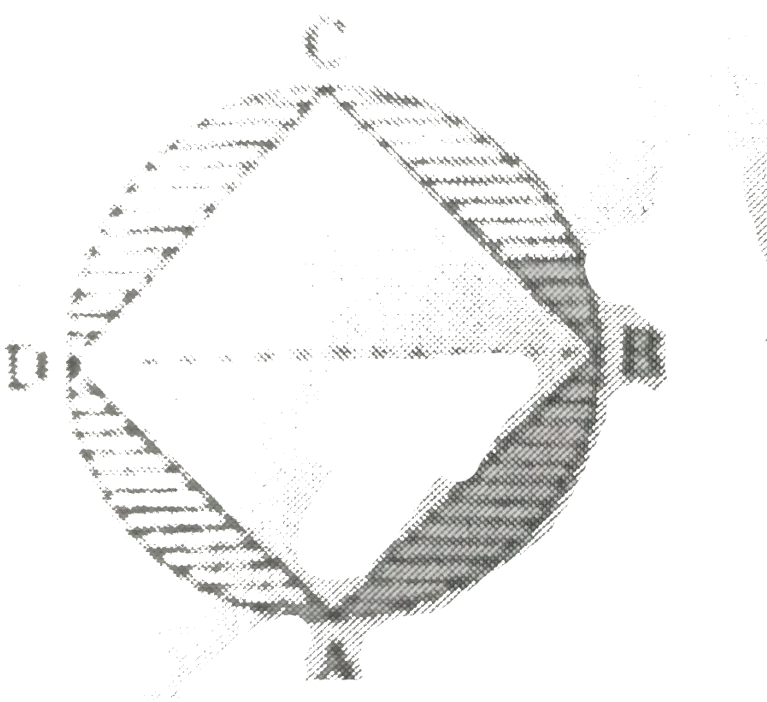
15. If Figure - 4, AB and CD are two diameter of a circle (with centre O) perpendicular to each other and OD is the diameter of the smaller circle.

IF $OA = 7$ cm, then find the area of the shaded region.



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16. In Figure - 5, ABCD is a square with side 7 cm. A circle is drawn circumscribing the square. Find the area of the shaded region.

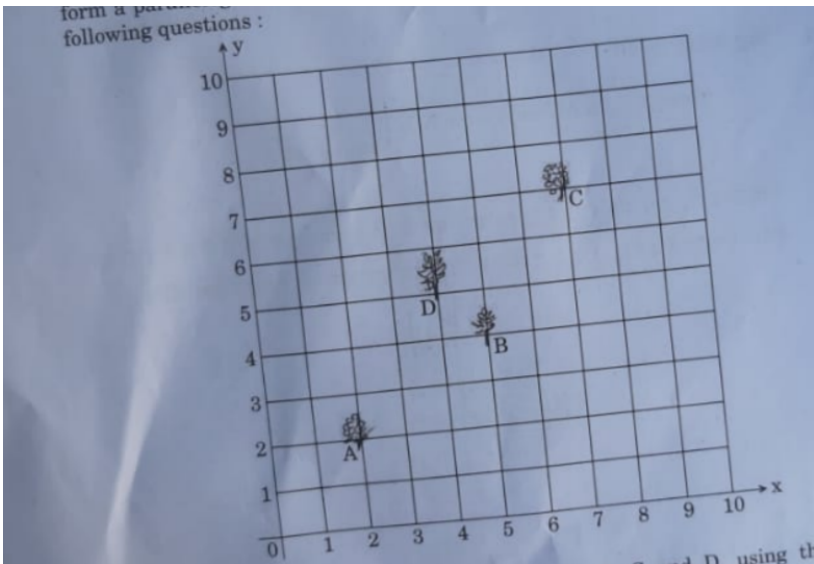


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17. Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle.

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18. Krishna has an apple orchard which has a $10m \times 10m$ sized kitchen garden attached to it. she divides it into a 10×10 grid and puts soil and manure into it. she grows a lemon plant at A, a coriander plant at B, an onion plant at C and a tomato plant at D. Her husband Ram praised her kitchen garden and points out that on joining A,B,C and D they may form a parallelogram. look at the below figure carefully and answer the following questions: (i) write the coordinates of the points A,B,C and D using the 10×10 grid as coordinate axes. (ii) find whether ABCD is a parallelogram or not.



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19. निम्नलिखित सर्वसमिकाओ को सिद्ध कीजिए:

$$\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} = 2 \sec A.$$

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20. Prove that $\sqrt{3}$ is an irrational number.

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21. The difference between two numbers is 26 and the larger number exceeds thrice of the smaller number by 4. Find the numbers.

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22. Solve for x and y :

$$\frac{2}{x} + \frac{3}{y} = 13, \quad \frac{5}{x} - \frac{4}{y} = -2 \quad (x \neq 0 \text{ and } y \neq 0)$$

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23. if A, B and C are interior angles of a $\triangle ABC$, then show that

$$\cos\left(\frac{B + C}{2}\right) = \sin\left(\frac{A}{2}\right)$$

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24. Prove that :

$$(\sin^4 \theta - \cos^4 \theta + 1) \operatorname{cosec}^2 \theta = 2$$

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25. Find the sum :

$$(-5) + (-8) + (-11) + \dots + (-230)$$

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26. Construct a $\triangle ABC$ with sides $BC = 6$ cm, $AB = 5$ cm and $\angle ABC = 60^\circ$. Then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of $\triangle ABC$.



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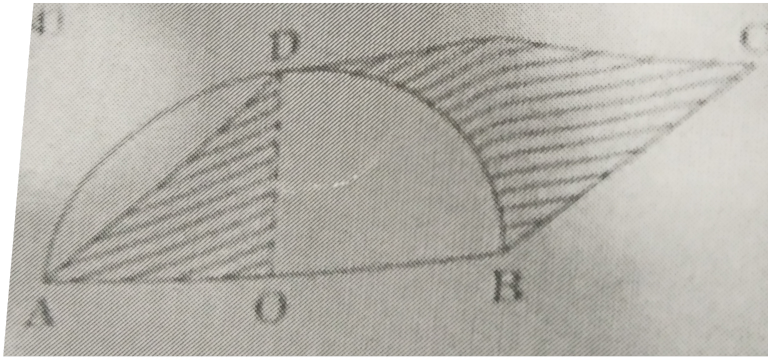
27. Draw a circle of radius 3.5 cm. Take a point P outside the circle at a distance of 7 cm from the centre of the circle and construct a pair of tangents to the circle from the point.



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28. In Figure , ABCD is a prallelogram. A semicircle with centre O and the diameter AB has been drawn and it passes through D. If $AB = 12$ cm and

OD \perp AB. Then find the area of the shaded region. (Use $\pi = 3.14$)



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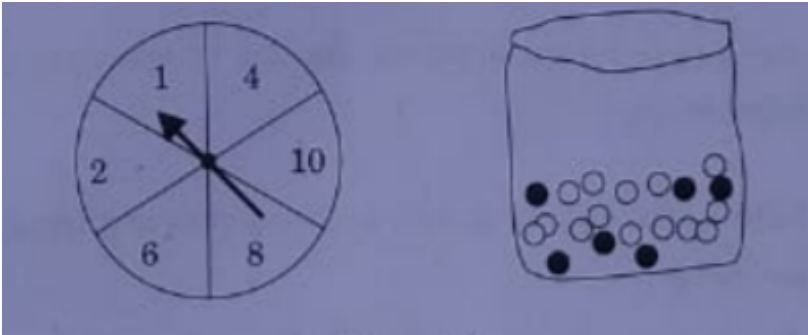
29. Read the following passage and answer the questions given at the end :

DIWALI FAIR

A game in a booth at Diwali Fair involves using a spinner first. Then, If spinner stops on an Even Number, the player is allowed to pick a marble from the bag. The spinner and Marbles are represented in Figure. Prizes are given when a black marble is picked. Shweta played the game once.

(i) what is the probability that she will be allowed to pick a marble from the bag.

(ii) Suppose she is allowed to pick a marble from the bag. what is the probability of getting a prize, when it is given bag contains 20 balls out of which 6 are black.



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30. A fraction becomes $\frac{1}{3}$ when 1 is subtracted from the numerator and it becomes $\frac{1}{4}$ when 8 is added to its denominator. Find the fraction.

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31. The present age of a woman is 3 years more than three times the age of her daughter. Three years hence, the woman's age will be 10 years more than twice the age of her daughter. Find their present ages.



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32. Find the ratio in which the y -axis divides the line segment joining the points $(6, -4)$ and $(-2, -7)$. Also find the point of intersection.



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33. Show that the points $A(7, 10)$, $B(-2, 5)$ and $C(3, -4)$ are the vertices of an isosceles right-angled triangle.



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34. Use Euclid's division lemma to show that the square of any positive integer is either of the form $3m$ or $3m + 1$ for some integer m .



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1. Two water taps together can fill a tank in $9\frac{3}{8}$ hours. The tap of larger diameter takes 10 hours less than the smaller one to fill the tank separately. Find the time in which each tap can separately fill the tank.



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2. A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 square metres more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the



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3. Find the curved surface area of frustum of a cone of height 12 cm and radii of circular ends are 9 cm and 4 cm.



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4. Draw a less than ogive for the following frequency distribution.



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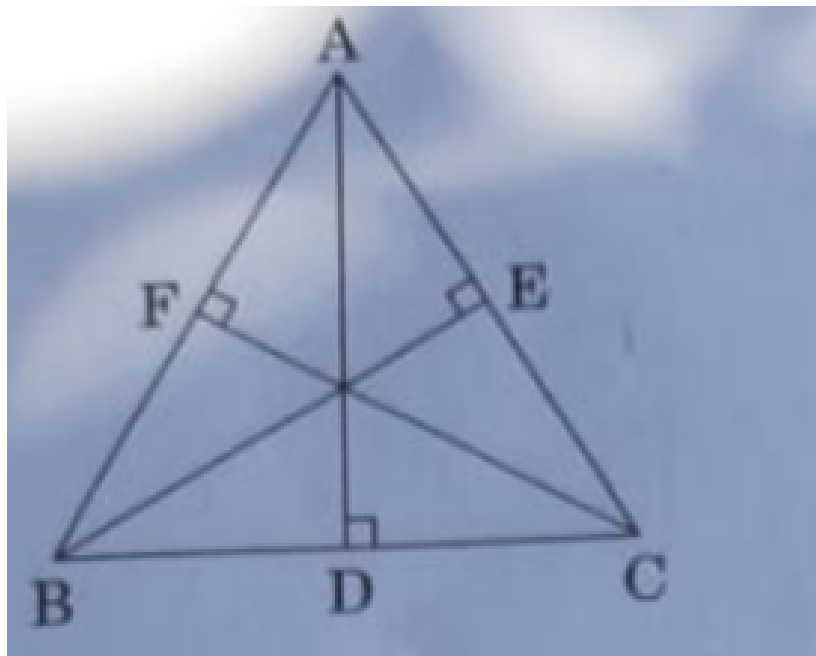
5. If a line is drawn to one side of a triangle to intersect the other two sides in distinct points, prove that the other two sides are divided in the same ratio.



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6. In Figure -6 , in an equilateral triangle ABC, AD is perpendicular to BC , BE is perpendicular to AC and CF is perpendicular to AB . Prove that

$$4(AD^2 + BE^2 + CF^2) = 9AB^2$$



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7. Find other zeroes of the polynomial $p(x) = 3x^4 - 4x^3 - 10x^2 + 8x + 8$, if two its zeros are $\sqrt{2}$ and $-\sqrt{2}$.

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8. Divide the polynomial $g(x) = x^3 - 3x^2 + x + 2$ by the polynomial $x^2 - 2x + 1$ and verify the division algorithm.

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9. A TV-tower stands vertically on a bank of a canal. From a point on the other bank directly opposite the tower, the angle of elevation of the top of the tower is 60° . From another point 20 m away from this point on the line joining this point to the foot of the tower, the angle of elevation of the top of tower is 30° (see fig.) . Find the height of the tower and the width of the canal.

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10. दो पानी के नल एक साथ एक हौज को $9\frac{3}{8}$ घंटों में भर सकते हैं। बड़े व्यास वाला नल हौज को भरने में, कम व्यास वाले नल से 10 घंटे कम समय लेता है। प्रत्येक द्वारा अलग से हौज को भरने के समय ज्ञात कीजिए।

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11. A rectangular park is to be designed whose breadth is 3 m less than its length. Its area is to be 4 square metres more than the area of a park that has already been made in the shape of an isosceles triangle with its base as the breadth of the

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12. A cylindrical bucket, 32 cm high and with radius of base 18 cm, is filled with sand. This bucket is emptied out on the ground and a conical heap of sand is formed. If the height of the conical heap is 24 cm, find the radius and slant height of the heap.

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13. From a point of a bridge across a river, the angles of depression of the banks on opposite sides of the river are 30° and 45° , respectively. IF

the bridge is at a height of 10 m from the banks, then find the width of the river. (Use $\sqrt{3} = 1.73$)

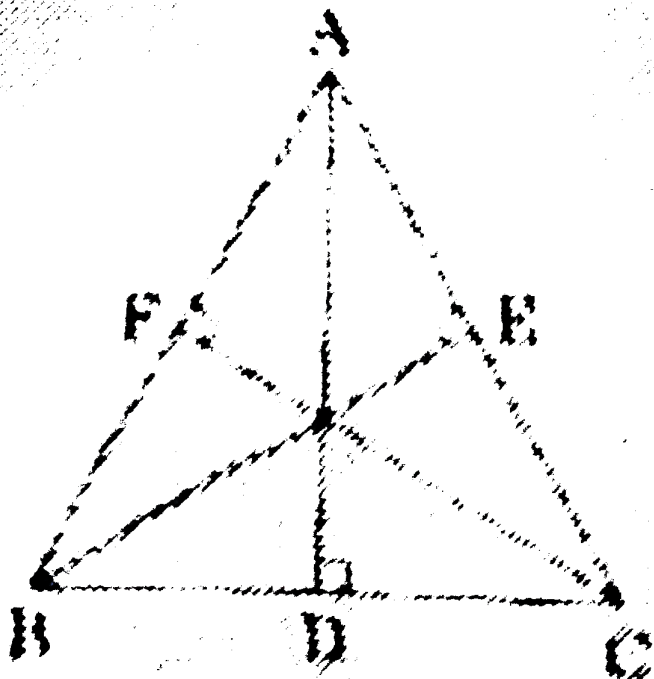
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14. If a line is drawn to one side of a triangle to intersect the other two sides in distinct points, prove that the other two sides are divided in the same ratio.

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15. In figure - 6 in an equilateral triangle ABC , $AD \perp BC$, $BE \perp AC$ and $CF \perp AB$. Prove that

$$4(AD^2 + BE^2 + CF^2) = 9AB^2$$



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16. Find other zeros of the polynomial

$$p(x) = 3x^4 - 4x^3 - 10x^2 + 8x + 8$$

if two of its zeroes are $\sqrt{2}$ and $-\sqrt{2}$

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17. Divide the polynomial $g(x) = x^3 - 3x^2 + x + 2$ by the polynomial $x^2 - 2x + 1$ and verify the division algorithm.

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18. Sum of the areas of two squares is $544m^2$. If the difference of their perimeters is 32 m. find the sides of two squares.

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19. A motor boat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.

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20. The distribution given below shows the number of wickets taken by bowlers in one-day cricket matches. Find the mean and the median of the

number of wickets taken

Number of wickets :	20 - 60	60 - 100	100 - 140	140 - 180	180 - 220	220 - 260
Number of bowlers :	7	5	16	12	2	3

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21. A statue $1.46m$ tall, stands on the top of the a pedestal. From a point on the ground the angle of the elevation of the top of the statue is 60° and from the same point, the angle elevation of the top of the pedestal is 45° . Find so the height of the pedestal. [Use $\sqrt{3} = 1.73$.]

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22. Obtain other zeroes of the polynomial $p(x) = 2x^4 - x^3 - 11x^2 + 5x + 5$ if two of its zeroes are $\sqrt{5}$ and $-\sqrt{5}$.

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23. What minimum must be added to $2x^3 - 3x^2 + 6x + 7$ so that the resulting polynomial will be divisible by $x^2 - 4x + 8$?

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24. In a cylindrical vessel of radius 10 cm, containing some water, 9000 small spherical balls are dropped which are completely immersed in water which raises the water level. If each spherical ball is radius 0.5 cm, then find the rise in the level of water in the vessel.

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25. If a line is drawn to one side of a triangle to intersect the other two sides in distinct points, prove that the other two sides are divided in the same ratio.

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1. If $(-3,-6)$ is the mid point of the line segment joining $(0,0)$ and (x,y) , then the point (x,y) is

(A) $(-3,6)$

(B) $(6,-6)$

(C) $(6,-12)$

(D) $(\frac{3}{2},-3)$

A. $(-3,6)$

B. $(6,-6)$

C. $(-6,12)$

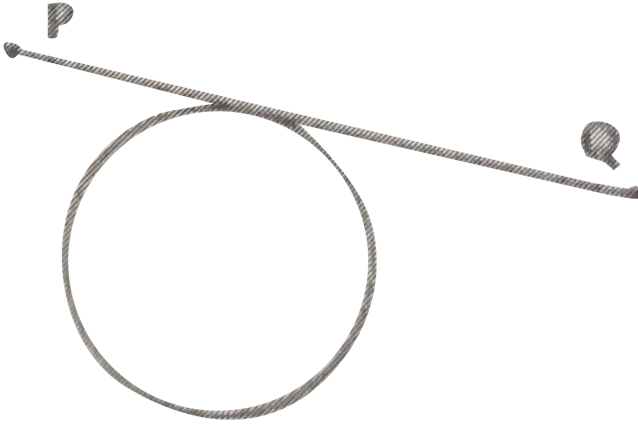
D. $\left(\frac{3}{2}, -3\right)$

Answer:



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2. In the given circle if Figure-1, number of tangents parallel to tangents PQ is



A. 0

B. many

C. 2

D. 1

Answer:



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3. The discriminant of the quadratic equation $4x^2 - 6x + 3 = 0$ is (A) 12
(B) 84 (C) $2\sqrt{3}$ (D) -12

A. 12

B. 84

C. $2\sqrt{3}$

D. -12

Answer:



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4. For the following frequency distribution

Class :	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25
Frequency :	8	10	19	25	8

The upper limit of median class is

A. 15

B. 10

C. 20

D. 25

Answer:



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5. If $\cos A = \frac{\sqrt{3}}{2}$, $0^\circ < A < 90^\circ$, then A is equal to

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

B. 30°

C. 60°

D. 1

Answer:



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6. The probability of an impossible event is 0 (b) 1 (c) $\frac{1}{2}$ (d) non-existent

A. 1

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

C. Not defined

D. 0

Answer:



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7. If a pair of linear equations is consistent, then the lines represented by them are

A. parallel

B. intersecting or coincident

C. always coincident

D. always intersecting

Answer:



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8. the distance between the points $(3, -2)$ and $(-3, 2)$ is

A. $\sqrt{52}$ units

B. $4\sqrt{10}$ units

C. $2\sqrt{10}$ units

D. 40 units

Answer: A



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9. 180 can be expressed as a product of its prime factors as

A. $10 \times 2 \times 3^2$

B. $25 \times 4 \times 3$

C. $2^2 \times 3^2 \times 5$

D. $4 \times 9 \times 5$

Answer:



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10. The total surface area of frustum shaped glass tumbler is $(r_1 > r_2)$

(a) $\pi r_1 l + \pi r_2 l$

(b) $\pi l(r_1 + r_2) + \pi(r_2)^2$

(c) $\frac{1}{3} \pi h \left((r_1)^2 + (r_2)^2 + r_1 r_2 \right)$

(d) $\sqrt{h^2 + (r_1 - r_2)^2}$

A. $\pi r_2 l + \pi r_2 l$

B. $\pi l(r_1 + r_2) + \pi r_2^2$

C. $\frac{1}{3} \pi h (r_1^2 + r_2^2 + r_1 r_2)$

D. $\sqrt{h^2 + (r_1 - r_2)^2}$

Answer:



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11. If 2 is a zero of the polynomial $ax^2 - 2x$ then the value of a is



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12. if the radii of two spheres are in the ratio 2 : 3, then the ratio of their respective volumes is -----.



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13. A line intersecting a circle in two points is called a _____.



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14. If $\text{ar}(\triangle PQR)$ is zero, then the points P, Q and R are -----.



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15. All squares are _____. (congruent/similar)



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16. A coin is tossed twice, the probability of getting head both the times is



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17. Find the radius of the sphere whose surface area is $36\pi \text{ cm}^2$.



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18. Find the value of x so that $-6, x, 8$ are in AP



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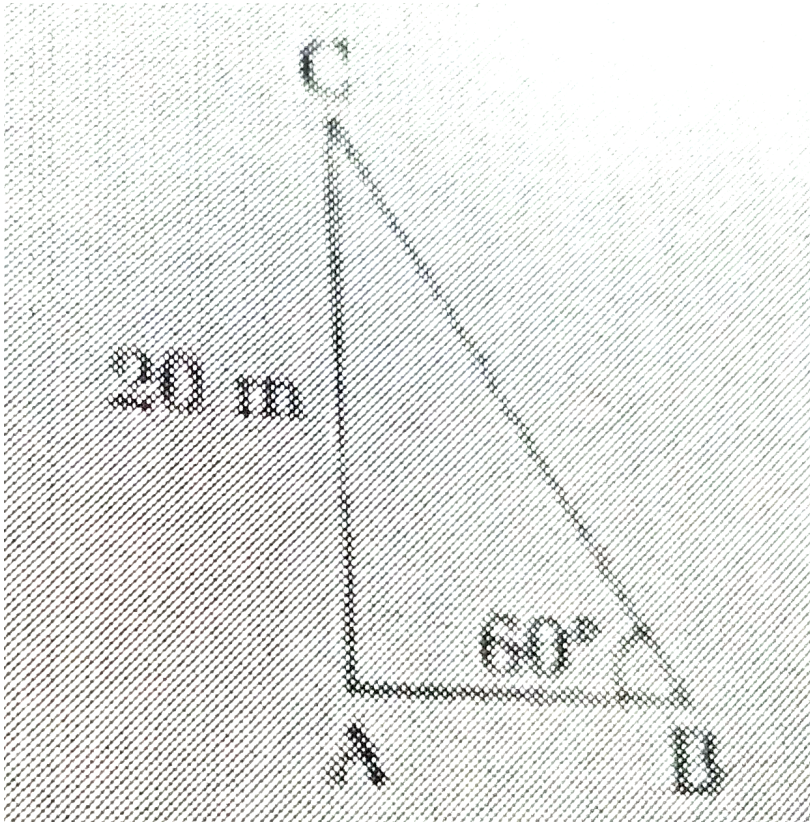
19. Find the 11th term of the A.P. $-27, -22, -17, -12, \dots$



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20. In figure , the angle of elevation of the top of a tower AC from a point B on the ground is 60° . If the height of the tower is 20 m, Find the

distance of the point from the foot of the power .



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21. Evaluate $\tan 40^\circ \times \tan 50^\circ$

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22. If $\cos A = \sin 42^\circ$, then find the value of A.



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Question

1. The value(s) of k for which the quadratic equation $2x^2 + kx + 2 = 0$ has equal roots, is

A. 4

B. ± 4

C. -4

D. 0

Answer:



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2. Which of the following is not an A.P.?

A. $-1.2, 0.8, 2.8, \dots$

B. $3.3, 3 + \sqrt{2}, 3 + 2\sqrt{2}, 3 + 3\sqrt{2}, \dots$

C. $\frac{4}{3}, \frac{7}{3}, \frac{9}{3}, \frac{12}{3}, \dots$

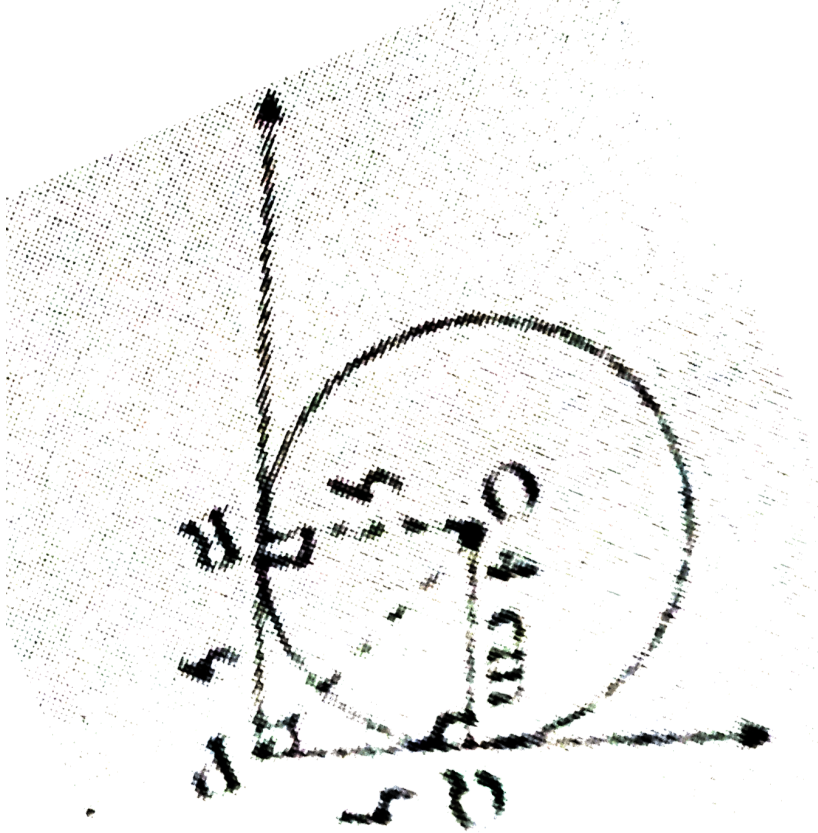
D. $\frac{-1}{5}, \frac{-2}{5}, \frac{-3}{5}$

Answer:



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3. In From an external point P, Two tangents PQ and PR are drawn to a circle of radius 4 cm with centre O . If $\angle QPR = 90^\circ$ then length of PQ is



A. 3cm

B. 4cm

C. 2cm

D. $2\sqrt{2}$ cm

Answer:



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4. The distance between the points $(m, -n)$ and $(-m, n)$ is

(A) $\sqrt{m^2 + n^2}$

(B) $m+n$

(C) $2\sqrt{m^2 + n^2}$

(D) $\sqrt{2m^2 + 2n^2}$

A. $\sqrt{m^2 + n^2}$

B. $m + n$

C. $2\sqrt{m^2 + n^2}$

D. $\sqrt{2m^2 + 2n^2}$

Answer:



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

A. 2

B. 1

C. more than 3

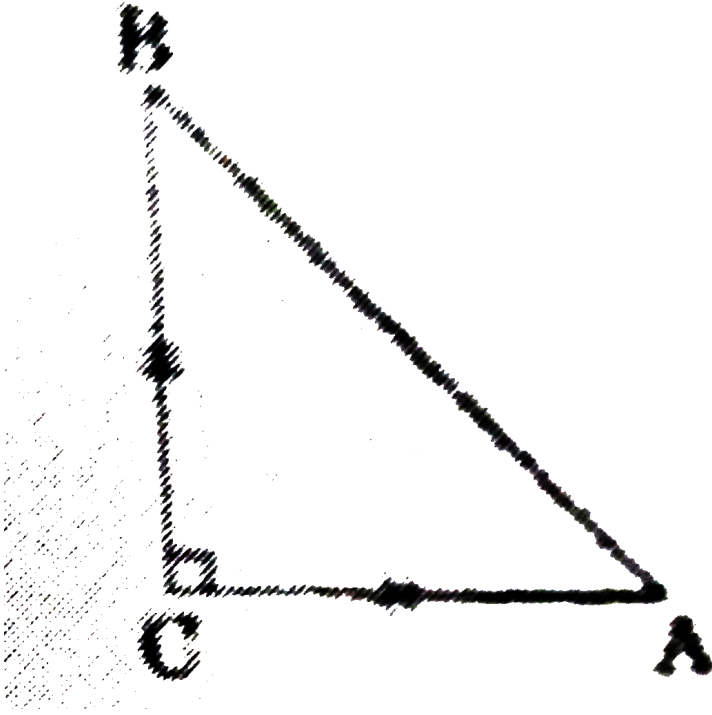
D. 3

Answer:



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6. In figure ABC is an isosceles triangle, right angled at C. Therefore



A. $AB^2 = 2AC^2$

B. $BC^2 = 2AB^2$

C. $AC^2 = 2AB^2$

D. $AB^2 = 4AC^2$

Answer:



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7. The point on the axis which is equidistant from $(-4,0)$ and $(10,0)$ is ,

a) $(7,0)$

(b) $(5,0)$

c) $(0,0)$

d) $(3,0)$

A. $(7, 0)$

B. $(5, 0)$

C. $(0, 0)$

D. $(3, 0)$

Answer:



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8. The centre of a circle whose end points of a diameter are $(-6,3)$ and $(6,4)$

a) $(8,-1)$

b) $(4,7)$

c) $(0, \frac{7}{2})$

d) $(4, \frac{7}{2})$

A. $(8, -1)$

B. $(4, 7)$

C. $(0, \frac{7}{2})$

D. $(4, \frac{7}{2})$

Answer:



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9. the pair of linear equations

$3x/2 + 5y/3 = 7$ and $9x + 10y = 14$ is

(a) consistent

(b) inconsistent

(c) consistent with one solution

(d) consistent with many solutions

A. consistent

B. inconsistent

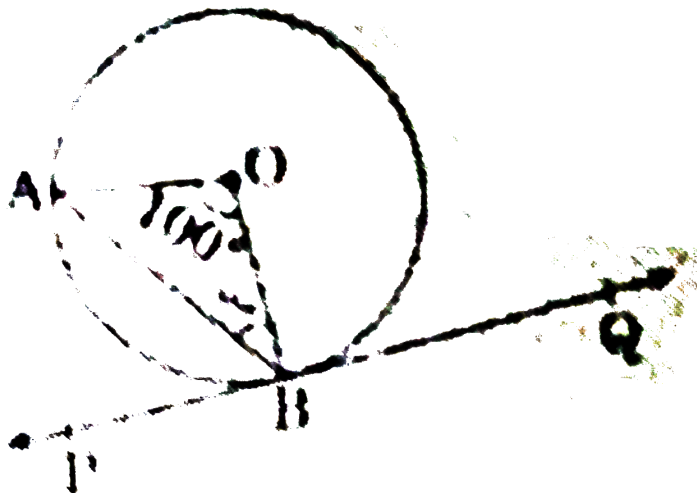
C. consistent with one solution

D. consistent with many solutions

Answer:

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10. In figure PQ is tangent to the circle with centre at O at the point B , if $\angle AOB = 100^\circ$, then $\angle ABP$ is equal to



A. 50°

B. 40°

C. 60°

D. 80°

Answer:



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11. The radius of a sphere (in cm) whose volume is $12\pi \text{ cm}^3$, is

(A) 3

(B) $3\sqrt{3}$

(C) $\frac{3^2}{3}$

(D) $\frac{3^1}{3}$

A. 3

B. $3\sqrt{3}$

C. $3^{2/3}$

D. $3^{1/3}$

Answer:



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12. Can $(x^2 - 1)$ be a remainder while dividing $x^4 - 3x^2 + 5x - 9$ by $x^2 + 3$ justify your answer with reasons.



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13. Find the sum of the first 100 natural numbers.



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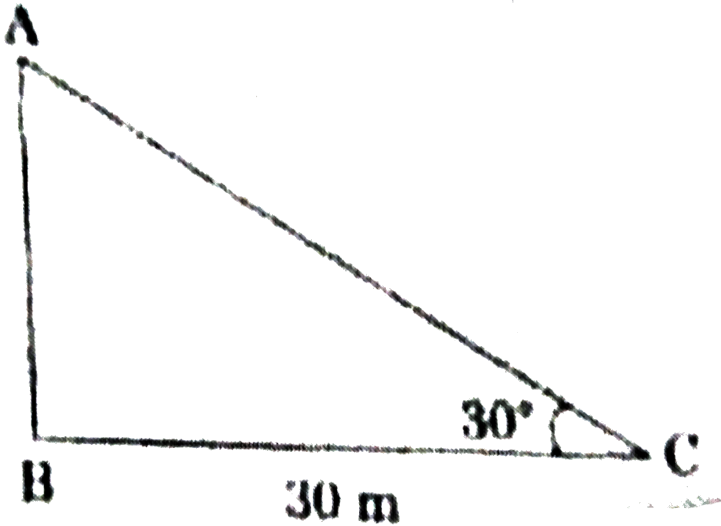
14. Evaluate :

$$2\sec 30^\circ \times \tan 60^\circ$$



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15. 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.

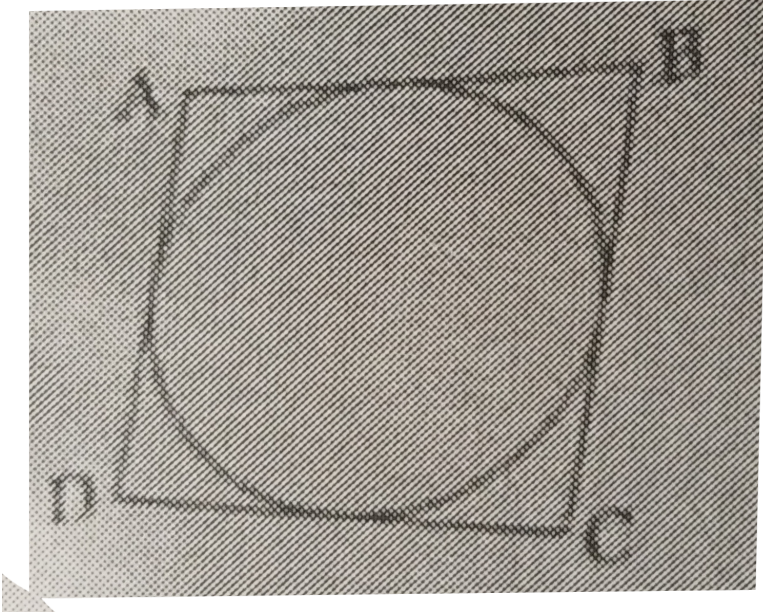


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16. In Figure, a quadrilateral ABCD is drawn to circumscribe a circle .

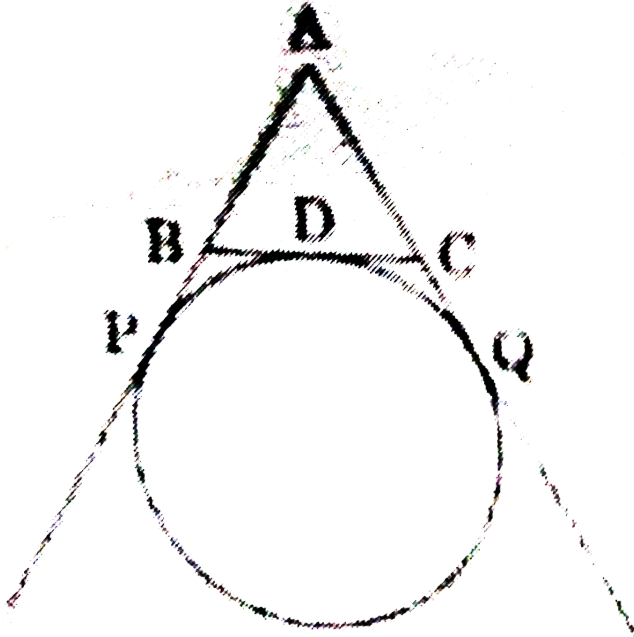
Prove that

$$AB + CD = BC + AD$$



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17. Find the perimeter of $\triangle ABC$, if $AP=12$ cm



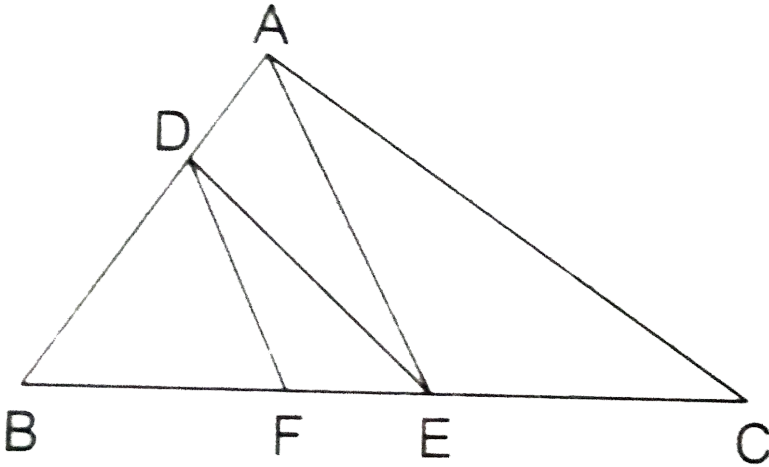
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18. How many cubes of side 2 cm can be made from a solid cube of side 10 cm ?

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19. In the given figure, $DE \parallel AC$ and $DF \parallel AE$.

Prove that $\frac{BF}{FE} = \frac{BE}{EC}$



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20. Show that $5+2\sqrt{7}$ is an irrational number, where $\sqrt{7}$ is given to be an irrational number.

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21. Check whether 12^n can end with the digit 0 for any natural number n .



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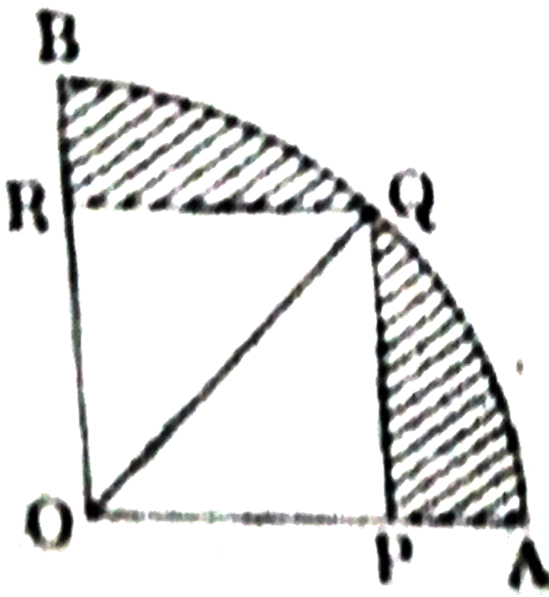
22. If A, B and C are interior angles of a ΔABC , then show that

$$\cot\left(\frac{B+C}{2}\right) = \tan\left(\frac{A}{2}\right).$$



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23. In Figure , a square OPQR is inscribed in a quadrant OAQB of a circle. If the radius of circle is $6\sqrt{2}$ cm, find the area of the shaded region



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24. Draw a triangle ABC with side $BC = 6$ cm, $AB = 5$ cm and $\angle ABC = 60^\circ$. Then construct a triangle whose sides are $\frac{3}{4}$ of the corresponding sides of the triangle ABC.

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25. Draw a circle of radius 3.5 cm . Take a point P outside the circle at a distance of 7 cm from the centre of the circle and construct a pair of tangents to the circle from the point.



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26. Prove that : $\frac{2 \cos^3 \theta - \cos \theta}{\sin \theta - 2 \sin^3 \theta} = \cot \theta$



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27. A fraction become $\frac{1}{3}$ when 1 is subtracted from the numerator and it becomes $\frac{1}{4}$ when 8 is added in the denominator. Find the fraction.



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28. The present age of a father is three years more than three times the age of the son. Three years hence, fathers age will be 10 years more than

twice the age of the son. Determine their present ages.

A. 13,43

B. 11,34

C. 10, 33

D. 12,45

Answer: C



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29. Using Euclid's Algorithm, find the largest number which divides 870 and 258 leaving remainder 3 in each case .



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30. find the ratio in which the y-axis divides the line segment joining the points (6,-4) and (-2,7). also find the point of intersection.





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31. Show that the points $A(7, 10)$, $B(-2, 5)$ and $C(3, -4)$ are the vertices of an isosceles right triangle.



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32. In an A.P. given that the first term $(a) = 54$, the common difference $(d) = -3$ and the n^{th} term $(a_n) = 0$, find n and the sum of first n terms (S_n) of the A.P.



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33. Read the following passage and answer the questions given at the end :

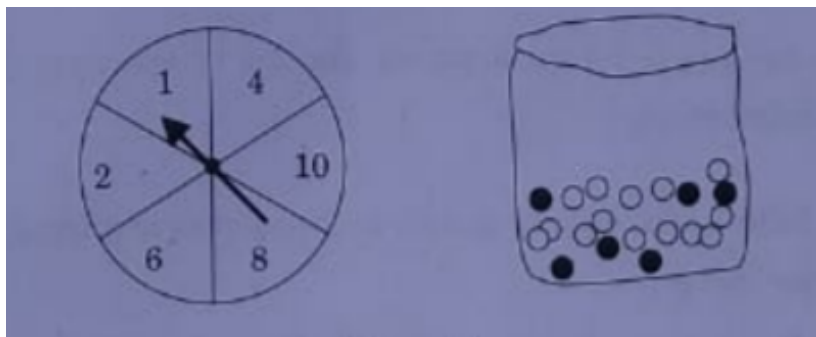
DIWALI FAIR

A game in a booth at Diwali Fair involves using a spinner first. Then, If spinner stops on an Even Number, the player is allowed to pick a marble

from the bag. The spinner and Marbles are represented in Figure. Prizes are given when a black marble is picked. Shweta played the game once.

(i) what is the probability that she will be allowed to pick a marble from the bag.

(ii) Suppose she is allowed to pick a marble from the bag. what is the probability of getting a prize, when it is given bag contains 20 balls out of which 6 are black.



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34. Sum of the areas of two squares is 544 m^2 . If the difference of their perimeters is 32. Find the sides of two squares.

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35. एक मोटर बोट , जिसकी स्थिर जल में चाल 18 km/h है , 24 km धारा के प्रतिकूल जाने , वही दूरी धारा के अनुकूल जाने की अपेक्षा 1 घंटा अधिक लेती है धारा की चाल ज्ञात कीजिए ।

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36. A solid toy is in the form of a hemisphere surmounted by a right circular cone of same radius. The height of the cone is 10 Cm and the radius of the base is 7 cm. Determine the volume of the toy. Also find the area of the coloured sheet required to cover the toy. (Use $\pi = 22/7$ and $\sqrt{149} = 12.2$)

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37. For the following data, draw a 'less than' ogive and hence find the median of the distribution.

Age (in years) :	0 - 10	10 - 20	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
Number of persons :	5	15	20	25	15	11	9

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38. the distribution given below shows the number of wickets taken by bowlers in one-day cricket matches. find the mean and the median of the number of wickets taken

Number of wickets :	20 – 60	60 – 100	100 – 140	140 – 180	180 – 220	220 – 260
Number of bowlers :	7	5	16	12	2	3

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39. From a point on the ground the angles of elevation of the bottom and top of a transmission tower fixed at the top of 20m high building are 45° and 60° respectively. Find the height of the transmission tower.

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40. PYTHAGORAS THEOREM : In a Right angled triangle; the square of hypotenuse is equal to the sum of the squares of the other two sides.

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41. Obtain other zeroes of the polynomial $p(x) = 2x^4 - x^3 - 11x^2 + 5x + 5$ if two of its zeroes are $\sqrt{5}$ and $-\sqrt{5}$.

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42. What minimum must be added to $2x^3 - 3x^2 + 6x + 7$ so that the resulting polynomial will be divisible by $x^2 - 4x + 8$?

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