



MATHS

BOOKS - EDUCART PUBLICATION

SAMPLE PAPER 11

Section A

1. The simplest form of $0.\bar{6}$ is :

A. $\frac{66}{99}$

B. $\frac{6}{9}$

C. $\frac{6}{99}$

D. $\frac{66}{9}$

Answer:



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2. If $(x + 1)$ is a factor of the polynomial

$2x^2 + 2ax + 5x + 10$, then the value of a is :



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3. If $\sin A = \frac{1}{2}$, then find the value of $\cos A$.

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

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

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

D. 1

Answer:



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4. The probability that a leap year, selected at random, will contain 53 Sunday is:

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

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

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

D. $\frac{4}{7}$

Answer:



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5. Find the value of k for which the system of linear equations $x + ky = 0$, $2x - y = 0$ has unique solution.

A. $k \neq \frac{1}{2}$

B. $k \neq \frac{3}{2}$

C. $k \neq \frac{1}{2}$

D. $k \neq -\frac{3}{2}$

Answer:



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6. If $\tan x = \sin 45^\circ \cos 45^\circ + \sin 30^\circ$ then x is equal to

A. 30°

B. 45°

C. 60°

D. 90°

Answer:



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7. If $504 = 2^m \times 3^n \times 7^p$, then the value of $m + n - p$ is

A. 2

B. 4

C. 7

D. 11

Answer:



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8. What is the area of a circle which can be inscribed in a square of side 8 cm ?

A. $9\pi cm^2$

B. $12\pi cm^2$

C. $16\pi cm^2$

D. $36\pi cm^2$

Answer:



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

A. 12

B. 13

C. 21

D. 19

Answer:



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10. What is the smallest odd composite number ?

A. 1

B. 5

C. 9

D. 12

Answer:



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11. If M $(5a,9)$ is the mid-point of A $(4,10)$ and B $(2a,8)$, then the value of a is :

A. 2

B. 1

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

D. -1

Answer:



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Section B

1. A piggy bank contains hundred 50p coins, fifty Rs. 1 coins, twenty ? 2 coins and ten Rs. 5 coins. If it is equally likely that one of the coins will fall out when the bank is turned upside down, what is the probability that the coin (i) will be a

A. $\frac{8}{25}$

B. $\frac{7}{25}$

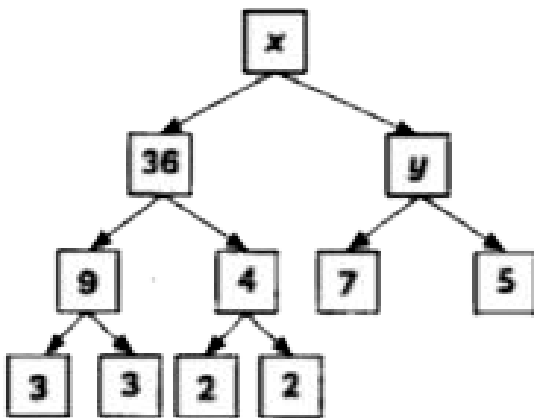
C. $\frac{3}{25}$

D. $\frac{1}{25}$

Answer:

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2. The value of x in the given factor tree is :



A. 360

B. 1620

C. 630

D. 1260

Answer:



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3. If $\tan \theta + \cot \theta = 5$, the value of $\tan^2 \theta + \cot^2 \theta$ is :

A. 25

B. 23

C. 27

D. 15

Answer:



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4. Find the radius of a circle whose centre is at the origin and a point $P(5, 0)$ lies on its circumference.

A. 34 units

B. 8 units

C. 5 units

D. 7 units

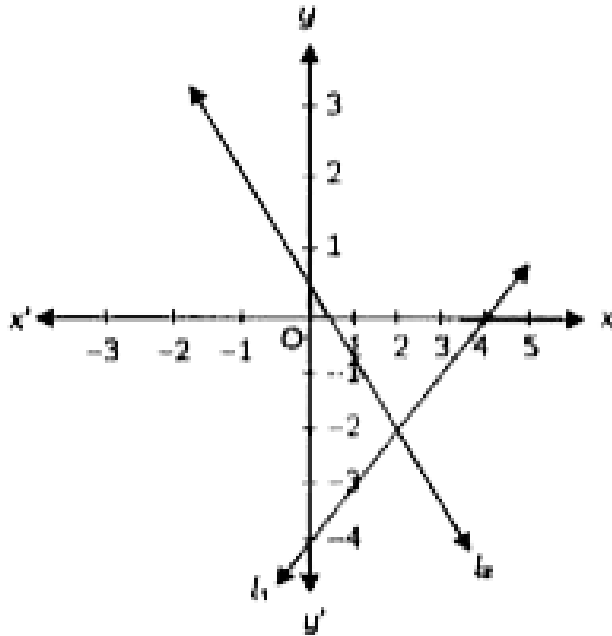
Answer:



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5. The solution of the pair of linear equations represented by lines l_1 and l_2 , in the given

graph, is:



A. $(4,0)$

B. $\left(0, \frac{1}{2}\right)$

C. $(2, -2)$

D. $(-4, 0)$

Answer:



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6. A single letter is selected at random from the word "PROBABILITY" . The probability that it is a vowel is

A. $\frac{4}{11}$

B. $\frac{5}{11}$

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

D. $\frac{7}{11}$

Answer:



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7. The HCF and LCM of two numbers are 9 and 360, respectively. If one number is 45, then the other number is:

A. 36

B. 18

C. 72

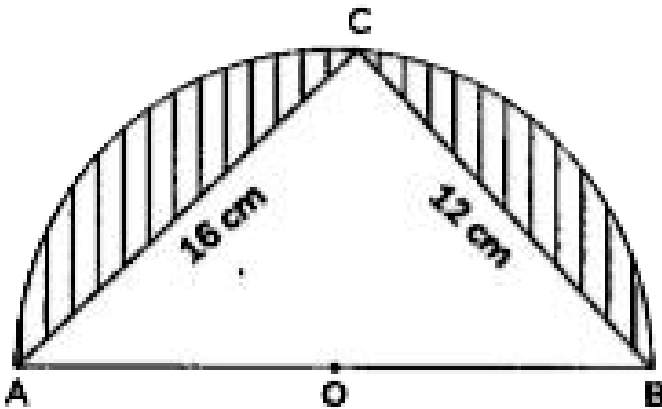
D. 35

Answer:



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8. In the given figure, if AOB is diameter, then the area of shaded region is: [Use $\pi = 3.14$]



A. 61cm^2

B. 532cm^2

C. 147cm^2

D. 227cm^2

Answer: A



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9. The larger of two supplementary angles exceeds thrice the smaller by 20 degrees. Find them.

A. 40° , 50°

B. 27.5° , 62.5°

C. 140° , 40°

D. 135° , 45° ,

Answer:



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10. In $\triangle DEC$, right angled at C, $EC = 24$ inches and $\angle EDC = 30^\circ$, then length of DE will be:

A. 12 inches

B. 24 inches

C. $16\sqrt{3}$ inches

D. $8\sqrt{3}$ inches

Answer:



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11. The solutions of pair of linear equations $x+y=3$ and $4x-3y=26$, will be:

A. $x = 5, y = -2$

B. $x = 5, y = 9$

C. $x = -2, y = 5$

D. $x = 9, y = 5$

Answer: A



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12. Find the coordinates of the point which divides the line segment joining the points A(4, -3) and B(9, 7) in the ratio: 3:2.

A. (7, 3)

B. (4, 2)

C. (5, 6)

D. (9, 4)

Answer:

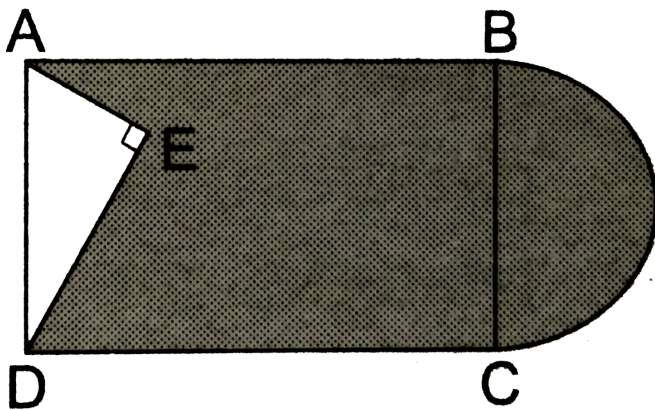


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13. In the given figure, from a rectangular region ABCD with $AB = 20cm$ a right triangle AED with $AE = 9cm$ and $DE = 12cm$, is cut

off. On the other end, taking BC as diameter, a semicircle is added on outside the region. The area of the shaded region.

[Use $\pi = 3.14$]



A. 84.55cm^2

B. 72.63cm^2

C. 84.55cm

D. 72.63cm

Answer:



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Section C

1. The highway overpass is represented graphically. Zeroes of a polynomial can be expressed graphically. Number of zeroes of polynomial is equal to number of points where

the graph of polynomial

(i) Intersects x-axis

(ii) Intersects y-axis

(iii) Intersects y-axis or x-axis

(iv) None of the above

A. intersect X-axis

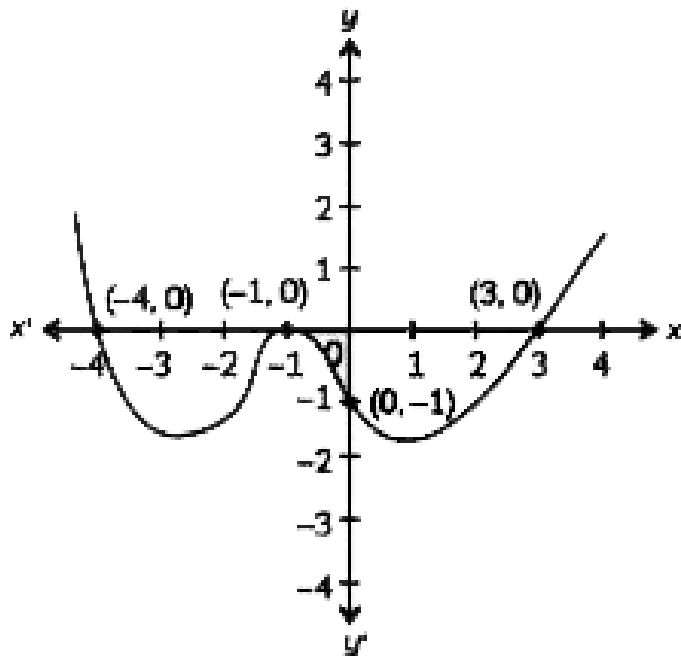
B. cuts y-axis

C. intersect y-axis

D. intersect origin

Answer:





2.

Evaluate from the graph, the zeroes of the polynomial function.

A. $-4, 1, 3$

B. $-4, -1, -3$

C. $4, 1, 3$

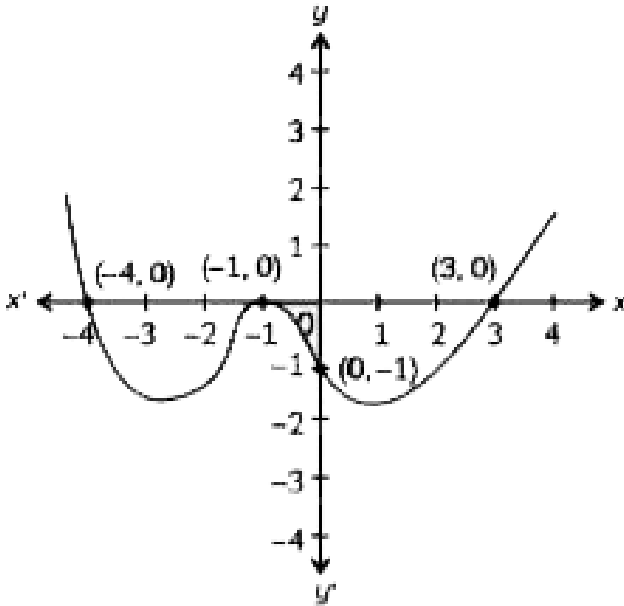
D. $-4, -1, 3$

Answer:



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3.

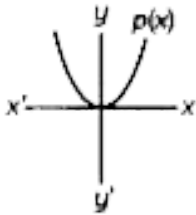


What is the maximum number of zeroes of the given graph?

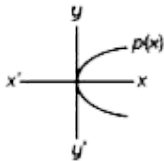


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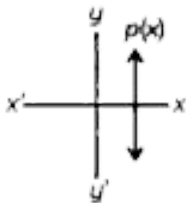
4. The graphs of $y = p(x)$ are given in figures below. Which among the following shows that $p(x)$ has no zero ?



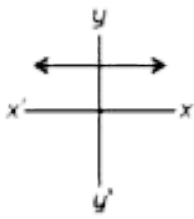
A.



B.



C.

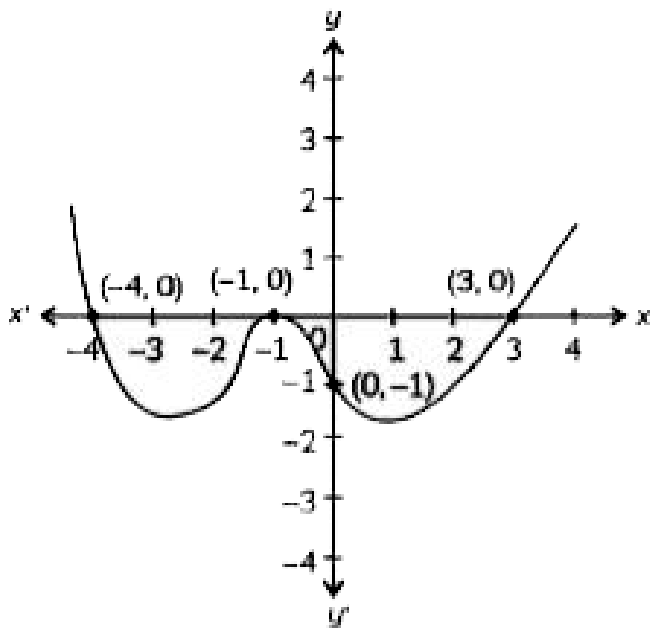


D.

Answer:



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5.

The graph of $y = f(x)$ is given. How many zeroes are there of $f(x)$?

A. 0

B. 1

C. 2

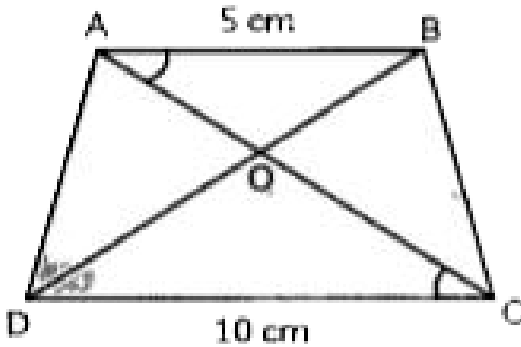
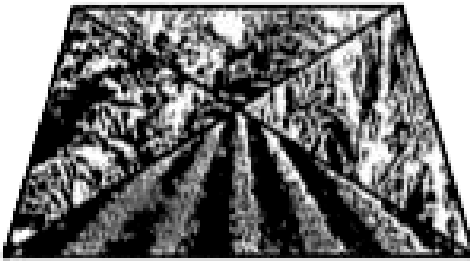
D. 3

Answer:



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6. Suresh's field is in the shape of a trapezium, whose map is in the scale $1 \text{ cm} = 20 \text{ m}$. He wants to draw four divisions in his field, so he could grow four different crops. The field is divided into four parts by joining the opposite vertices



Triangles AOB and COD are:

- A. similar by SAS criteria
- B. similar by RHS criteria
- C. similar by AA criteria
- D. not similar

Answer:



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7. If $y = \tan^{-1}(\sec x - \tan x)$, then
differentiation of y wrt x is equal to = ?

A. 1 : 4

B. 1 : 2

C. 2 : 1

D. 4 : 1

Answer:



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8. Which of the following would be true, if the ratio of the perimeters of two similar triangles $\triangle AOB$ and $\triangle COD$ would have been 1 : 4 ?

A. $CD = 2AB$

B. $CD = 4AB$

C. $AB = 2CD$

D. $AB = 4CD$

Answer:



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9. If in triangles PQR and XYZ

$$\frac{PQ}{XZ} = \frac{PR}{XY} = \frac{QR}{YZ}, \text{ then :}$$

A. $\triangle PRQ - \triangle XZY$

B. $\triangle QRP - \triangle YXZ$

C. $\triangle PQR - \triangle XYZ$

D. $\triangle PQR - \triangle XZY$

Answer:



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10. If $y = \tan^{-1}(\sec x - \tan x)$, then
differentiation of y wrt x is equal to = ?

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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Part A Section I

1. If $x = 2^2 \times 3^3 \times 7^2$, $y = 2^3 \times 3^2 \times 5 \times 7$,

then find HCF (x,y)



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2. What is the HCF of the smallest prime number and the smallest composite number?



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3. if α, β are the roots of the equation $5x^2 - 7x + 2$ then sum of their reciprocals



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4. If the lines represented by $3x + 2py = 2$ and $2x + 5y + 1 = 0$ are parallel, then find the value of p .



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5. Find the 14^{th} term of the AP, 7, 10, 13,.....



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6. Solve for x and y $y, x + y = 3$ and $7x + 6y = 2$.



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7. Form a quadratic polynomial, whose zeros are -2 and 8 .



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8. For what values of 'a' does the quadratic equation $x^2 - ax + 1 = 0$ not have real roots?



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9. If p and q are the roots of the quadratic equation $x^2 + px - q = 0$, then find the values of p and q.



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10. Which term of the AP, 2, 19, 36, 53,, is 172?



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11. Find the distance between the points (3,4) and (6,5).

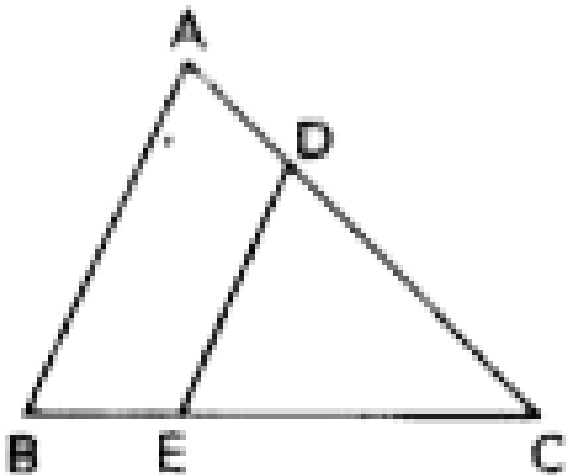


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12. The perimeter of a triangle with vertices $(0,4)$, $(0,0)$ and $(3,0)$ is

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13. In the figure, if $\angle A = \angle B$ and $AD = BE$. Prove that $CD = CE$.





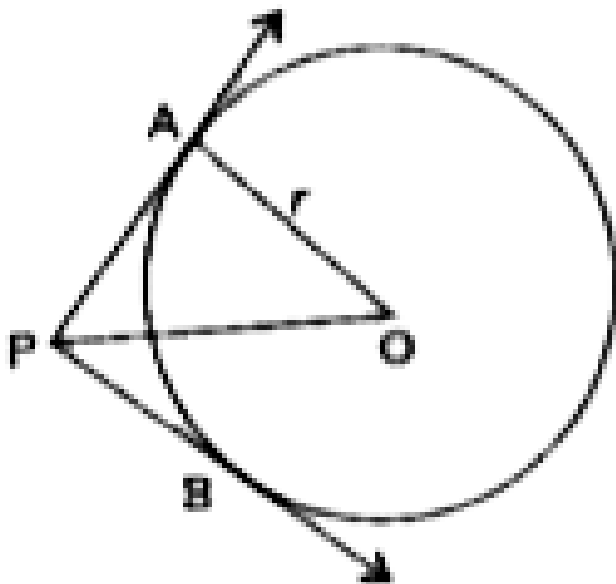
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14. What is the distance between two parallel tangents to a circle of radius 5 cm?



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15. In the figure, $\angle APB = 90^\circ$. Find the length of OP.



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16. $\triangle ABC \sim \triangle DEF$ such that
 $DE = 3\text{cm}$, $EF = 2\text{cm}$, $DF = 2.5\text{cm}$ and
 $BC = 4\text{cm}$. Find the perimeter of $\triangle ABC$.



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



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18. If $\operatorname{cosec} A - \cot A = 1.3$, then find the value of $\operatorname{cosec} A + \cot A$.



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19. If $\triangle ABC$ is right angled at C, then find the value of $\cos (A + B)$



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20. A wire is in the shape of a circle of radius 100cm. It is bent to form a square. Find the length of its side. (Take $\pi = 3.14$)



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21. If the areas of three adjacent faces of a cuboid are x , y , z respectively, then the volume of the cuboid is xyz (b) $2xyz$ (c) \sqrt{xyz}
(d) $3\sqrt{xyz}$



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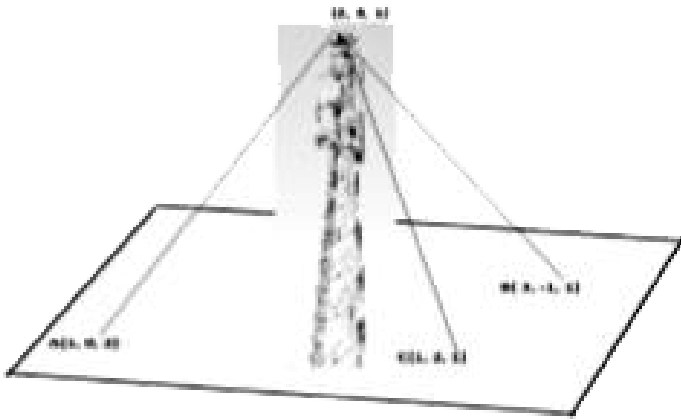
Part A Section Ii

1. Solve for x : $\frac{3x + 8}{4} - 2x = \frac{3x + 2}{2} + 4$



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2. A mobile tower stands at the top of a hill. Consider the surface on which the tower stands as a plane having points $A(1, 0, 2)$, $B(3, -1, 1)$ and $C(1, 2, 1)$ on it. The mobile tower is tied with 3 cables from the point A, B and C such that it stands vertically on the ground. The top of the tower is at the point $(2, 3, 1)$ as shown in the figure.



Based on the above answer the following:

The height of the tower from the ground is

A. 45°

B. 30°

C. 60°

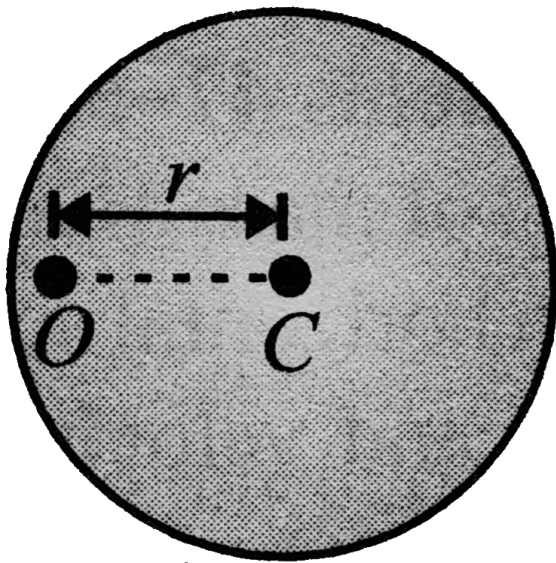
D. 75°

Answer:



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3. A disc of mass M and radius R can rotate freely in a vertical plane about a horizontal axis at O distance r from the centre of the disc as shown in Fig. The disc is released from rest in the shown position. Answer the following questions based on the above information



M, R

Reaction force exerted by the hinge on the disc at the instant when disc rotates by an angle of 37° is

A. 60°

B. 75°

C. 30°

D. 45°

Answer:



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4. In a row of children, Deepti is ninth from the left and Kashish is thirteenth from the right. They exchange their positions and then Deepti becomes seventeenth from the left. Find the new position of Kashish from the right end of the row.

A. 15°

B. 25°

C. 30°

D. 45°

Answer:



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5. In $\triangle ABC$, right angled at B, if $AB:BC = 3:4$ and $AC = 20$, then find AB and BC.



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6.

If

$\sin 3\theta = \cos(\theta - 6^\circ)$, where 3θ and $(\theta - 6^\circ)$

are acute angle then the value of θ is

_____.

A. $r-2$

B. $\sqrt{r^2 + 4^2}$

C. $r + 2$

D. $\sqrt{r^2 - 4^2}$

Answer:



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7. If $\sin 3\theta = \cos(\theta - 6^\circ)$, where 3θ and $(\theta - 6^\circ)$ are acute angle then the value of θ is _____.

A. 5 m

B. 6 m

C. 9 m

D. 12 m

Answer:



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8. If $y = \tan^{-1}(\sec x - \tan x)$, then
differentiation of y wrt x is equal to = ?

A. 90°

B. 60°

C. 120°

D. 106°

Answer:



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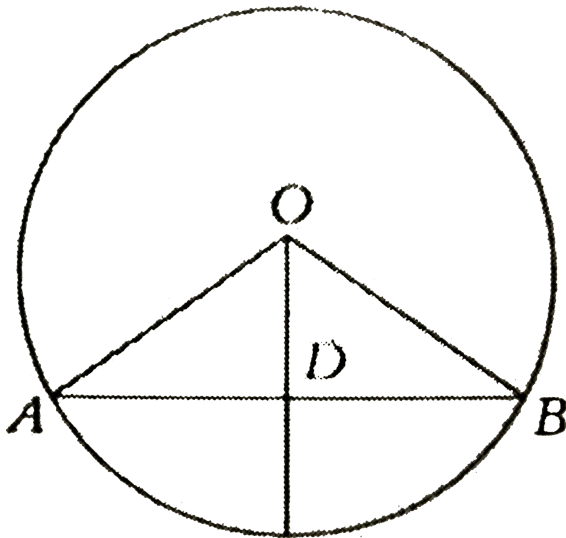
9. If $a : b = 2 : 3$, $b : c = 4 : 5$ and $c = 15$, then

$$a^2 - b = ?$$



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10. The perpendicular drawn from the centre of a circle bisects any chord of the circle. The following are the steps involved in proving the above result. Arrange them in sequential order.



(A) Let $\overline{OD} \perp \overline{AB}$.

(B) Let AB be the chord of the circle with centre O .

(C) $\triangle ODA \equiv \triangle ODB$ (By RHS congruence property).

(D) $OA = OB$ (radii), $OD = OD$ (common side) and $\angle ODA = \angle ODB = 90^\circ$

(E) $AD = DB$ (corresponding parts in congruents triangles).

A. 752 cu m

B. 805 cu m

C. 1016 cu m

D. 1214 cu m

Answer:



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11.

Mass (in grams)	80-100	100-120	120-140	140-160	160-180
Frequency	20	60	70	p	60

If total number of apples is 250, the value of p is

A. 50

B. 40

C. 35

D. 45

Answer:



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12. Find a polynomial with sum of roots as 7 and product of roots as 3.



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13.

Mass (in grams)	80-100	100-120	120-140	140-160	160-180
Frequency	20	60	70	p	60

If total number of apples is 250, the mean mass of the apples is

A. 139 g

B. 142 g

C. 150 g

D. 156 g

Answer:



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14.

Mass (in grams)	80-100	100-120	120-140	140-160	160-180
Frequency	20	60	70	p	60

If total number of apples is 250, then the upper limit of the median class is

- A. 80
- B. 100
- C. 120
- D. 140

Answer:



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15. If $\tan(A - B) = \frac{1}{\sqrt{3}}$ and $\cos(A + B) = \frac{1}{2}$, $0^\circ < A, B < 90^\circ$, Then find the value of $A + 3B$.



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16. The probability that a machine will accept a particular Rs 1 coin is 0.9. The probability that the machine will not accept a particular Rs 1 coin, is

A. 0.01

B. 0.1

C. 0.02

D. 0.2

Answer:



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17. If 10 coins of Rs. 10, five coins of Rs. 5 are to be placed in a line, then the probability that the extreme coins are of Rs. 5 is

A. 0.01

B. 0.1

C. 0.02

D. 0.2

Answer:



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18. The probability that the machine will accept a particular Rs 1 coin is 0.9. Jayant has

three Rs 1 coins. The probability that the machine accept all these coins, is

A. 0.729

B. 0.81

C. 0.9

D. 0.271

Answer:



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19. The probability that the machine will accept a particular Rs 1 coin is 0.9. Jayant has three Rs 1 coins. The probability that the machine accept none of these coins, is

A. 0.729

B. 0.81

C. 0.9

D. 0.271

Answer:



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20. Solve: $0.\overline{43} - 1.\overline{76} + 3.\overline{12}$



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Part B Section Iii

1. Given that $\sqrt{5}$ is irrational , prove that $2\sqrt{5} - 3$ is an irrational number.



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2. Without actually performing the long division, find if $\frac{987}{10500}$ will have terminating or non-terminating (repeating) decimal expansion. Give reasons for your answer



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3. Prove that the points $(a, b + c)$, $(b, c + a)$ and $(c, a + b)$ are collinear.



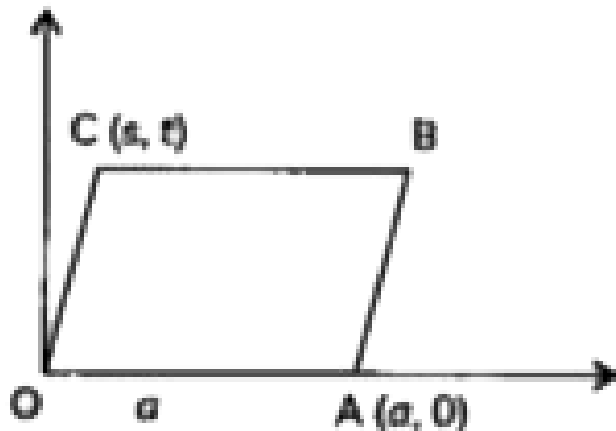
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4. The two opposite vertices of a square are $(1, 2)$ and $(3, 2)$. Find the coordinates of the other two vertices.



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5. In the figure, OABC is a rhombus, where O is the origin.



Write down the coordinates of B in terms of a , s and t .



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6. ABC is an isosceles triangle in which $AB = AC$.
Prove that the tangent to the circum-circle at A is parallel to BC.



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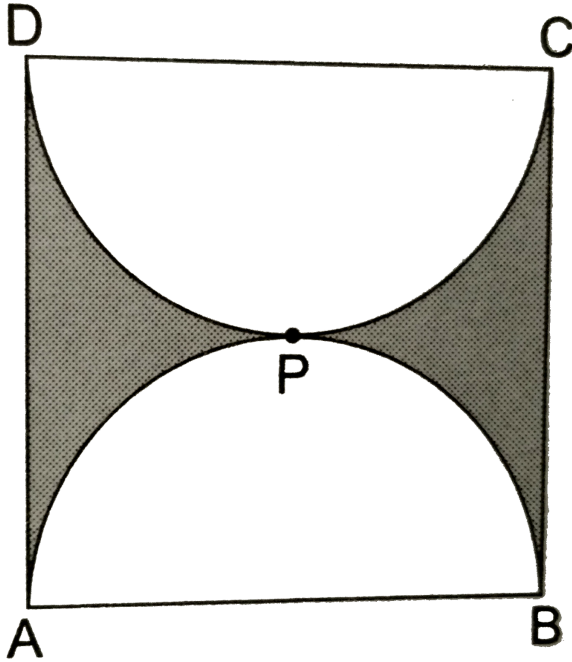
7. In an acute angled ΔABC , $\sec(B + C - A) = 2$ and $\tan(C + A - B) = \frac{1}{\sqrt{3}}$. Find the three angles of ΔABC .



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8. Find the perimeter of the shaded region in the figure, if ABCD is a square of side 14 cm and

APB and CPD are semicircles.



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Part B Section Iv

1. Show that 12^n cannot end with the digits 0 or 5 for any natural number n



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2. Which term of the AP: -5, 3, 11, ..., will be 83?



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3. If one of the zeroes of the cubic polynomial

$x^3 + ax^2 + bx + c$ is -1 , then find the

product of other two zeroes.



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

(i) four real roots (ii) two real roots

(iii) no real roots (iv) one real root



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5. 5 books and 7 pens together cost Rs 434,

whereas 7 books and 5 pens together cost Rs

550, find the total cost of 1 book and 2 pens.



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6.

$$(\tan A)(1 + \sec A) - \frac{\tan A}{1 - \sec A} = 2 \operatorname{cosec} A$$



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7. If $\sin \theta = \frac{12}{13}$, find the value of

$$\frac{\sin^2 \theta - \cos^2 \theta}{2 \sin \theta \cos \theta} - \frac{1}{\tan^2 \theta}.$$



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8. A solid right circular cone is cut into two parts at the middle of its height by a plane parallel to its base. The ratio of the volume of the smaller cone to the whole cone is: 1:2 (b) 1:4 (c) 1:6 (d) 1:8



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9. Find all possible integral values of x for which satisfy, $x^2 + 3x - 28 < 0$



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Part B Section V

1. If the zeros of the polynomial $f(x) = ax^3 + 3bx^2 + 3cx + d$ are in A.P., prove that $2b^3 - 3abc + a^2d = 0$.



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2. From the top of a tower h m high, angles of depression of two objects, which are in line with the foot of the tower are α and β ($\beta > \alpha$). Find the distance between the two objects.



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3. Two tangents TP and TQ are drawn to a circle with centre O from an external point T .

Prove that $\angle PTQ = 2\angle OPQ$.





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4. Prove that the area of the semicircle drawn on the hypotenuse of a right angled triangle is equal to the sum of the areas of the semicircles drawn on the other two sides of the triangle



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