MATHS

BOOKS - EDUCART PUBLICATION

SAMPLE PAPER 03

Section A

1. What is the value of k in the quadratic is one of polynomial $3x^2 + 2kx - 3$, if $x = \frac{1}{2}$ the zeroes of it?

A. $\frac{1}{5}$

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

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

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

Answer: D

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2. A circle, has its centre at (-1, 3). If one end of a diameter of the circle has co-ordinates (2,5),

then find the co-ordinates of the other end of the diameter.

A. (-4,1)

B. (1,8)

C. (0.5, 4)

D. (-1,4)

Answer: A

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3. $\frac{1+\tan^2 A}{1+\cot^2 A} = ..$

A. $\sec^2 A$

B. -1

C. $\cot^2 A$

D. $\tan^2 A$

Answer: D

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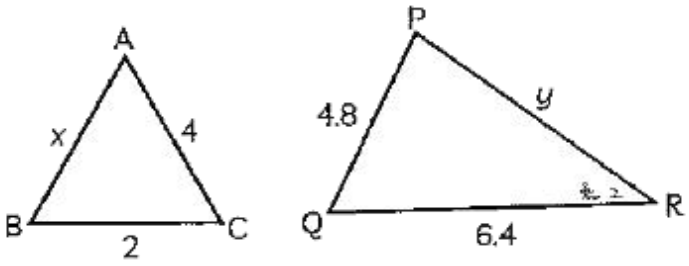
4. What is value of x + y, if ΔABC and ΔPQR are similar?



A. 12.8 cm

B. 12.5 cm

C. 14.3 cm

D. 14 cm

Answer: B

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5. If we toss two unbiased coins simultaneously, then the probability of getting no head is $\frac{A}{B}$. Then $(A+B)^2$ will be equal to:

A. 21

B. 25

C. 10

D. 5

Answer: B

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6. What is the smallest number by which $\frac{891}{3500}$ must be multiplied so it becomes a terminating decimal?

A. 6

B. 7

C. 10

D. 5

Answer: B

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7. The value of k for which the system of equations x+y -4 = 0 and 2x + ky = 3 has no solution, is:

A. -2

B. $\neq 2$

C. 2

D. 3

Answer: C

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8. If 1 - p is a root of the quadratic equation $x^2 + px + 1 - p = 0$, then its roots are

A. 0,-1

B. 1,-1

C. 1, 0

D. 0, 0

Answer: A

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9. In an isosceles right angled triangle, what is the length of the equal sides of the triangle, if its hypotenuse is $6\sqrt{2}$ cm?

A. $3\sqrt{2}cm$

B. 6 cm

C. 12 cm

D. 5 cm

Answer: B

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10. The area of the largest circle, that can be drawn inside a rectangle with sides 18 cm. by 14 cm, is

A. $\frac{12}{7}cm^2$

B. $\frac{17}{7}cm^2$

C. $\frac{77}{8}cm^2$

D. $\frac{22}{7}cm^2$

Answer: C

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11. Find the value of p if the distance between the points (4, p) and (1, 0) is 5.

A. ± 4

B. ± 6

C. ± 8

D. ± 7

Answer: A

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12. What is the value of k if the point (-3, k) divides the line segment joining the points (-5, -4) and (-2, 3) in a certain ratio?

A. -1

B. 3

C. 2

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

Answer: D

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13. if 3 is the least prime factor of number a and 7 is the least prime factor of number b, then the least prime factor of a+b , is

A. 0

B. 1

C. 2

D. 3

Answer: C

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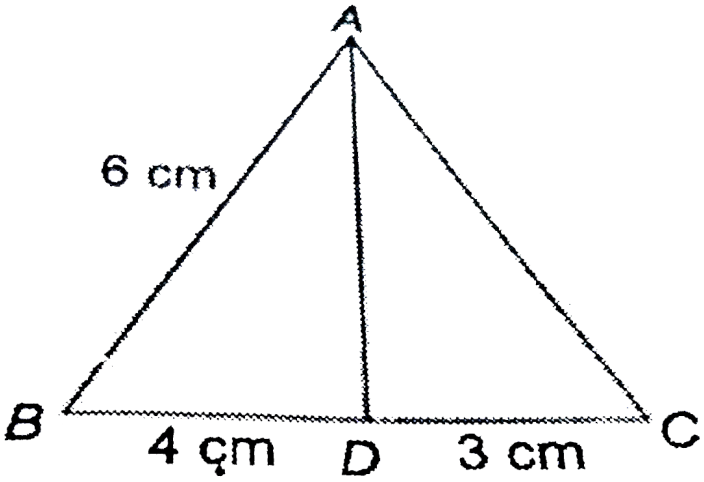
14. In the given figure AD is the bisector of $\angle A$.

If BD= 4 cm , DC = 3 cm and AB = 6cm . Find AC.



A. 4.5 cm

B. 6 cm

C. 3 cm

D. 7 cm

Answer: A

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15. Find the area of a quadrant of a circle whose circumference is 44 cm.

A. $\frac{77}{2}cm^2$

B. $77cm^2$

C. $\frac{44}{7}cm^2$

D. $44cm^2$

Answer: A

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16. The HCF of 85 and 153 can be expressed in the form of 85m - 153. Calculate the value of m.

A. 1

B. 5

C. -1

D. 2

Answer: D

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17. What is the total number of factors of a prime number?

A. 0

B. 1

C. 2

D. 3

Answer: C

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18. Find the distance between the following pair of points: $(a\sin\alpha,\ -b\cos\alpha)$ and $(-a\cos\alpha,\ b\sin\alpha)$ (ii) $(a,\ 0)$ and $(0,\ b)$

A. 1

B. $\sqrt{a^2+b^2}$

C. $2\sqrt{a^2+b^2}$

D. $\sqrt{a^2+b^2}(\sin\alpha+\cos\alpha)$

Answer: D

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19. For the given polynomial $p(x)=x^2-5x-1$, if α and β are its zeroes, then find the value of $\alpha^2\beta+\alpha\beta^2$

A. -5

B. 4

C. 0

D. -7

Answer: A

20. The centroid of a ΔABC with vertices A(-4, 6), B(2,-2) and C(2, 5) is:

A. (3, 0)

B. $\left(\frac{8}{3}, 3\right)$

C. $\left(3, \frac{8}{3}\right)$

D. (0, 3)

Answer: D

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Section B

1. Find the value of - $\frac{3-4\sin^2 A}{4\cos^2 A-3}$ If sec $A=\frac{17}{8}$.

A. $\frac{33}{611}$

B. $\frac{53}{78}$

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

D. $\frac{17}{64}$

Answer: A

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2. A,B and C start at the same time in the same direction to run around a circular stadium. A completes a round in 252 seconds, B in 308 seconds and C in 198 seconds, all starting at same point After what time will they again at the starting point ?

A. 46 min 12 sec

B. 42 min 6 sec

C. 52 min 12 sec

D. 56 min 10 sec

Answer: A

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3. If a number x is chosen at random from the number $-2, -1, 0, 1, 2.$ What is the probability that $x^2 < 2$?

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

B. $\frac{1}{5}$

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

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

Answer: C

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4. The diagonals of a rhombus are 10 cm and 24 cm. Find the length of a side of the rhombus.

A. 9 cm

B. 13 cm

C. 15 cm

D. 17 cm

Answer: B

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5. In ΔABC, DE || BC. If AD = 2x - 1, AE = 2x + 5, BD = x - 3 and CE = x - 1, then the value of x is:

A. 8

B. 9

C. 10

D. 11

Answer: A

6. What is the ratio of the areas of a circle and an equilateral triangle whose diameter and a side are respectively equal?

A. $\sqrt{2}:\pi$

B. $\sqrt{3}:\pi$

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

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

Answer: C

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7. 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: A

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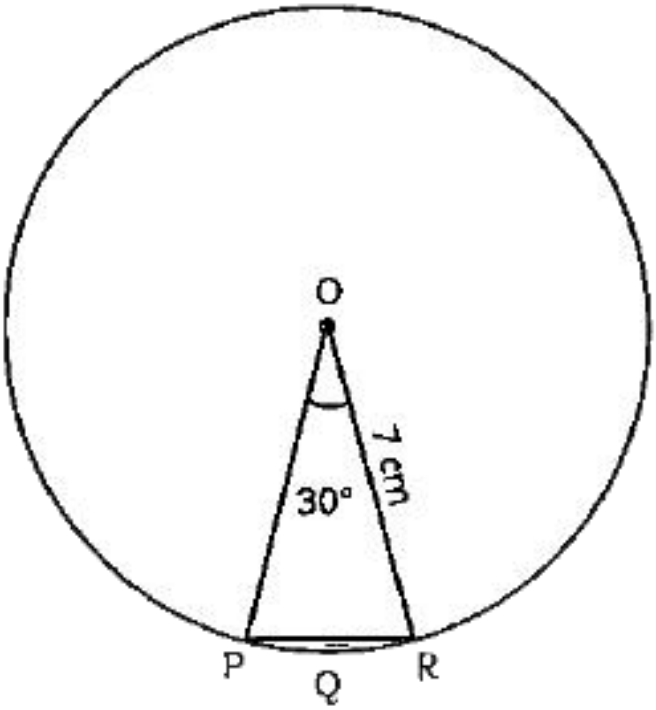
8. What is the area of the segment PQR, in the given figure, if the radius of the circle is 7 cm?

(use $\pi = \frac{22}{7}$)



A. $\frac{12}{7} cm^2$

B. $\frac{11}{5} cm^2$

C. $\frac{22}{7} cm^2$

D. $\frac{7}{12} cm^2$

Answer: D

9. Cards marked with the numbers 2 to 101 are placed in a box and mixed thoroughly. One card is drawn from this box. Find the probability that the number on the card is: a number which is a perfect square (ii) a prime number less than 20.

A. $\frac{1}{20}$

B. $\frac{7}{100}$

C. $\frac{9}{100}$

D. $\frac{3}{100}$

Answer: D

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10. The H.C.F. And L.C.M. of two numbers are 44 and 264 respectively . If the first number is dividded by2, the quotient is 44, The other numbes is

A. 66

B. 132

C. 58

D. 73

Answer: B

11. Find the zeroes of the polynomial: $6x^2 - 7x - 3$

A. $-\frac{1}{3}, \frac{2}{3}$

B. $-\frac{1}{2}, \frac{1}{3}$

C. $-\frac{1}{3}, \frac{3}{2}$

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

Answer: C

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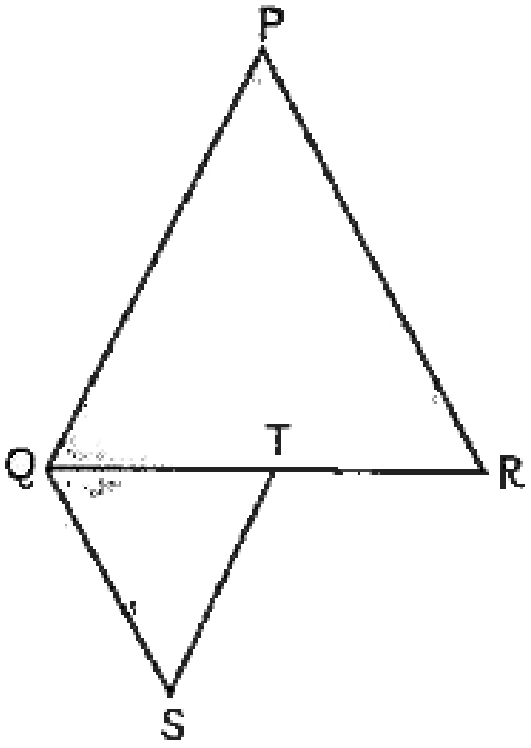
12. ΔPOR and ΔQST are two equilateral triangles such that T is the mid-point of QR.

Find the ratio of areas of ΔPOR and ΔQST.



A. $1:1$

B. $1:2$

C. $2:1$

D. $4:1$

Answer: D

13. The point which divides the line segment joining the points (8,–9) and (2,3) in ratio 1 : 2 internally lies in the

A. (6,-5)

B. (5,5)

C. (1,-4)

D. (2,3)

Answer: A

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14. If three points $(0,\ 0)$, $\left(3,\ \sqrt{3}\right)$ and $(3,\ \lambda)$ form an equilateral triangle, then $\lambda =$ (a) 2 (b) -3 (c) -4 (d) None of these

A. -4

B. 2

C. -3

D. $\pm\sqrt{3}$

Answer: D

15. The king, queen and jack of clubs are removed from a deck of 52 playing cards and the remaining cards are shuffled. A card is drawn from the remaining cards. Find the probability of getting a card of (i) heart (ii) queen (iii) clubs.

A. $\frac{10}{49}$

B. $\frac{5}{49}$

C. $\frac{8}{49}$

D. $\frac{13}{49}$

Answer: A

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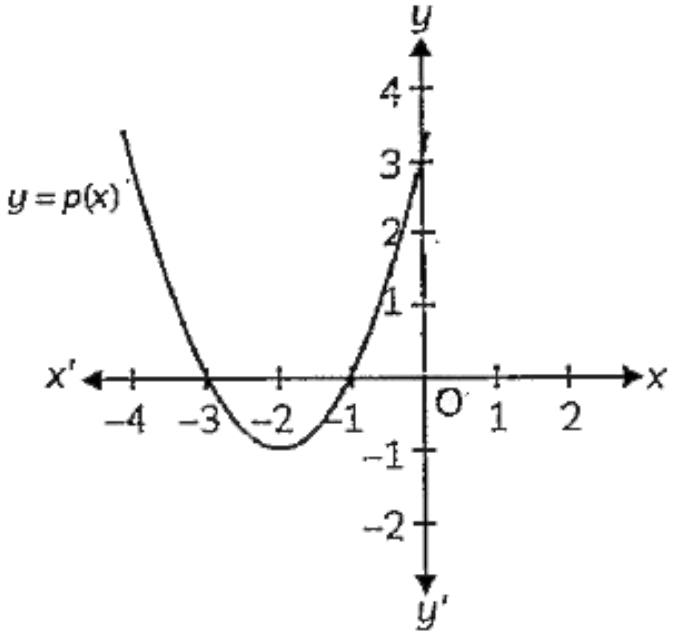
16. The graph of a polynomial p(x) is given in the figure. What are the zeroes of the

polynomial p(x) ?



A. 3 and 0

B. -3 and -1

C. -3 and 0

D. -1 and 0

Answer: B

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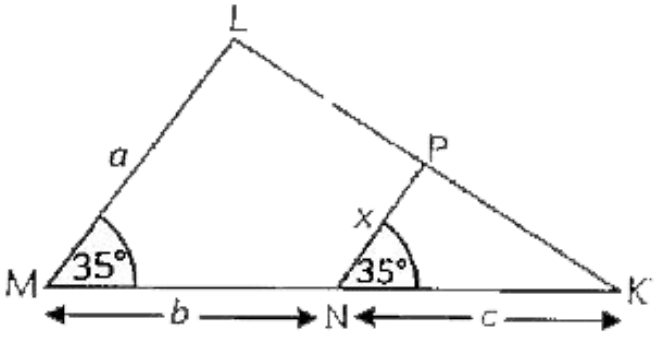
17. Evaluate the value of x in terms of a, b and c.



A. $\frac{ac}{b+c}$

B. $\frac{ab+ac}{b^2}$

C. $\left(\frac{1}{a}+\frac{1}{b}\right)^2$

D. $\frac{a+b}{c}$

Answer: A

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18. What is the value of a, If 2 is a zero of the polynomial $p(x)=4x^2+2x-5a$?

A. 4

B. 6

C. -1

D. 0

Answer: A

19. Determine the ratio in which the line $3x + y - 9 = 0$ divides the segment joining the points (1,3) and $(2, 7)$.

A. $4:3$

B. $3:4$

C. $4:7$

D. $7:4$

Answer: B

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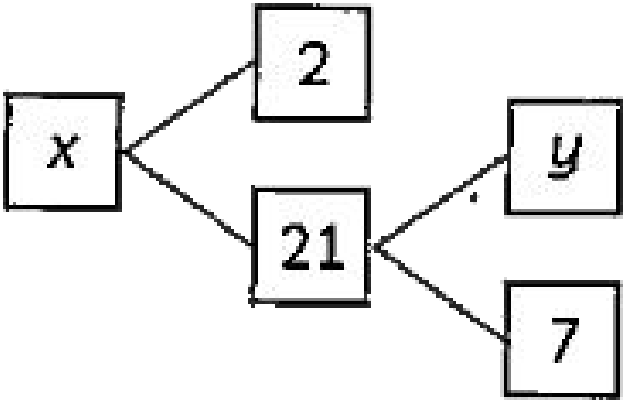
20. Calculate $\frac{x}{y}$



A. 14

B. 3

C. 15

D. 18

Answer: A

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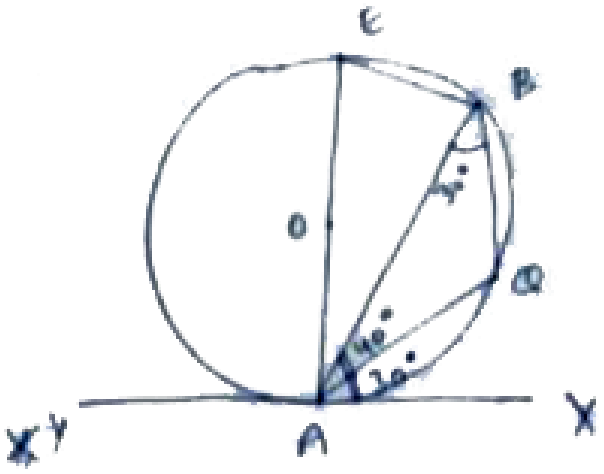
Section C

1. $\angle BAX = 70^\circ \angle BAX = 40^\circ \angle ABX = ?$



A. 6 m

B. $6\sqrt{3}m$

C. 12 m

D. $12\sqrt{3}m$

Answer: C

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2. PA and PB are tangents to a circle with centre 0, from a point P outside the circle, and

A and B are point on the circle. If $\angle APB = 30^\circ$, then $\angle OAB$ is equal to:

A. 6 m

B. 12 m

C. $6\sqrt{3}m$

D. $12\sqrt{3}m$

Answer: C

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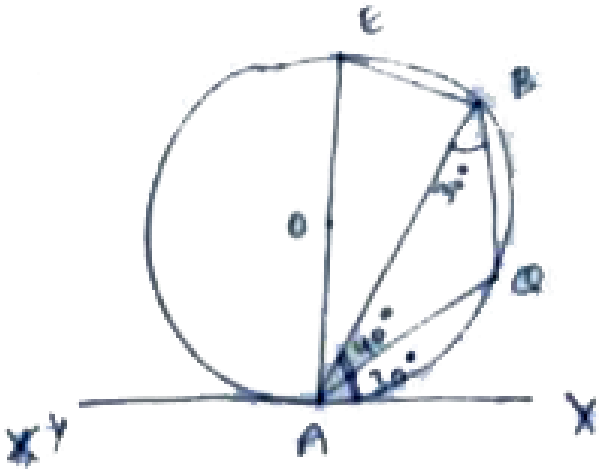
3. $\angle BAX = 70^\circ \angle BAX = 40^\circ \angle ABX = \ ?$



A. $1:2$

B. $1:\sqrt{3}$

C. $\sqrt{3}:1$

D. $1:1$

Answer: D

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4. The valiue of $\sin 60^\circ \cos 30^\circ + \sin 30^\circ \cos 60^\circ$ is _____.

A. 1

B. 0

C. -1

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

Answer: A

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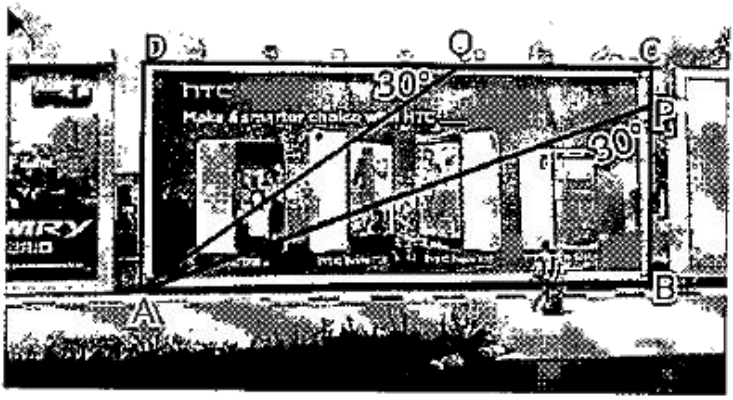
5. Neeraj who belongs to a small town in Maharashtra was coming to a big city for the first time. As he was driving past the Mumbai airport road along with his family, he observed a big billboard of length 6 m and width 3 m. Further, $\angle DQA = 30^\circ$ and $\angle APB = 30^\circ$



The length of (AP + AQ) is:

A. $6\left(\sqrt{3}+1\right)m$

B. $18m$

C. $36m$

D. $12\left(\sqrt{3}+1\right)m$

Answer: B

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6. Solve for (x,y) and hence find the value of $4x - 3y$.

$y = 5x + 20$

$y = 8x + 50$

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7. Solve for xand y:

$y = 0.25x + 20$

$y = 0.08x + 40$

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8. What are the values of x and y in the system of linear equations $4x + 5y = -3$ and $2x - y = 2$?

A. (-3, -2)

B. (3, 2)

C. (-3, 2)

D. (3, -2)

Answer: D

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9. If the system of pair of linear equations $kx + 4y = 2, 7x + 3y = 1$ has a unique solution, then the value of k is :

A. k = 6

B. $k \neq 6$

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

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

Answer: B

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10. Rajesh want to choose a best plan for his mobile phone. He has 2 options available with him. The first plan of company A, cost Rs. 20 per month, with costing an additional 25 paise per minute.

The second plan of company B charges Rs. 40 per month, but calls cost 8 paise per minute. These two situations are shown below in the form of linear equations.

$y = 0.25x + 20$

and $y = 0.08x + 40$

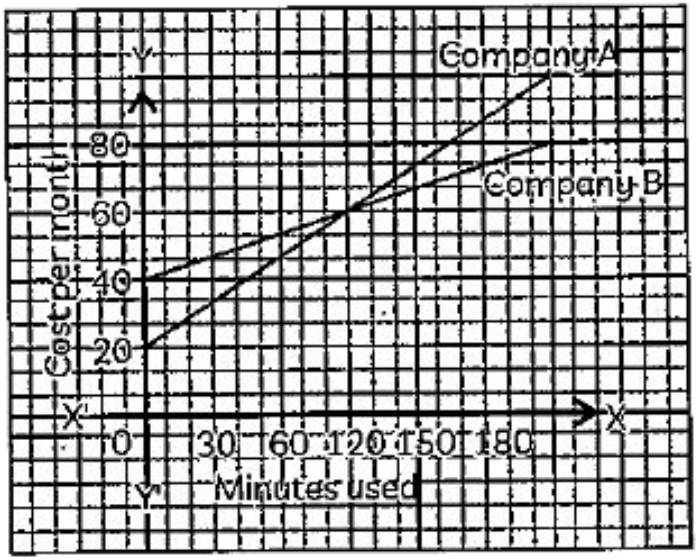
Where, x is the minutes used any is the total cost per month

Cost: Plans prices range from under 10 to over 100

Types of Plan: Prepaid and post-paid or phone on a plane

Network: Coverage

Other benifits: Calls, SMS, Data and other extras



Which type of lies is represented by the system of linear equations $x + 2y - 4 = 0, 2x + 4y - 12 = 0$?

A. Coincident lines

B. Parallel lines

C. Intersecting lines

D. Can't say

Answer: B

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Section A

1. Write the discriminant of the quadratic equation $(x+5)^2 = 2(5x-3)$.

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2. Find after how many places of decimal the decimal form of the number $\frac{27}{2^3 . 5^4 . 3^2}$ will terminate.

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3. Express 429 as a product of its prime factors.

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4. Find the sum of first 10 multiples of 6.

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5. Find the value(s) of x, if the distance between the points A(0, 0) and B(x, -4) is 5 units.

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

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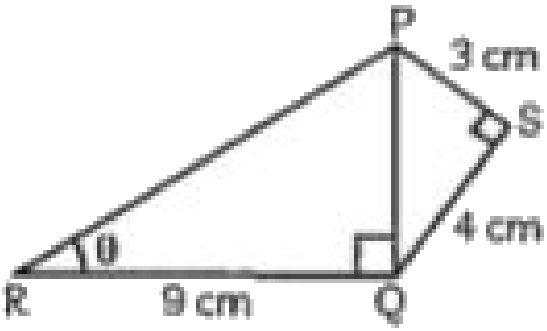
7. In Figure, PS=3 , QS = 4 cm, $\angle PRQ = \theta, \angle PSQ = 90^\circ, PQ \perp RQ$ and

RQ = 9 cm. Evaluate tan θ.



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8. If $\tan\alpha = \frac{5}{12}$,find the value of sec α.

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Section B

1. Points A(3, 1), B(5, 1), C(a, b) and D(4, 3) are vertices of a parallelogram ABCD. Find the values of a and b.

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2. Points P and Q trisect the line segment joining the points A(-2, 0) and B(0, 8) such that, P is near to A. Find the coordinates of points P and Q.

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3. Solve the following pair of linear equations

$3x - 5y = 4$ and $2y + 7 = 9x$

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4. If HCF of 65 and 117 is expressible in the form 65n-117, then find the value of n.

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5. On a morning walk, three persons step out together and their steps measure 30 cm, 36 cm and 40 cm respectively. What is the minimum distance each should walk so that each can cover the same distance in complete steps?

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6. A die is thrown once. Find the probability of getting a composite number.

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7. A dice is thrown once. Find the probability of getting a prime number .

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8. Using completing the square method, show that the equation $x^2 - 8x + 18 = 0$ has no solution.

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9. Cards numbered 7 to 40 were put in a box. Poonam selects a card at random. What is the probability that Poonam selects a card which is a multiple of 7?

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Section C

1. The perpendicular from A on side BC of a Δ ABC meets BC at D such that DB = 3CD. Prove

that $2AB^2 = 2AC^2 + BC^2$

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2. AD and PM are medians of triangles ABC and PQR respectively where $\Delta ABC \sim \Delta PQR$. Prove that: $\frac{AB}{PQ} = \frac{AD}{PM}$.

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3. Find remainder when $p(x) = x^5 - 4x^3 + x^2 + 3x + 1$ is divide by

$g(x) = x^3 - 3x + 1.$

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4. Find the area of the triangle formed by joining the mid-points of the sides of the triangle whose vertices are $(0, -1), (2, 1)$ and $(0, 3)$. Find the ratio of this area to the area of the given triangle.

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5. Find the values of x and y which satisfy the equations:

$y + 4x = 9$ and $3y + 2x = 5$

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

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7. Find the greatest number which on dividing 251 and 628 leaves remainders 1 and 3 respectively.

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8. If A, B and C are interior angles of a triangle ABC, then show that $\sin\left(\frac{B+C}{2}\right) = \frac{\cos A}{2}$.

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9. If $\angle A = 90^\circ$, then find the value of $\tan\left(\frac{B+C}{2}\right)$

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

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11. PQ is a chord of length 8 cm of a circle of radius 5 cm. The tangents at P and Q intersect at a point T. Find the length TP.

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

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

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14. The ratio of the number of students of three class is $2:3:5$ .If 20 students are added in each class then the ratio becomes $4:5:7$ .Find the number of student in each class before adding .

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15. A car has two wipers which do not overlap. Each wiper has a blade of length 21 cm, sweeping through an angle of 120°. Find the total area cleaned at each sweep of the blades.

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Section D

1. A pole has to be erected at a point on the boundary of a circular park of diameter 13 metres in such a way that the differences of its distances from two diametrically opposite fixed gates A and B on the boundary is 7 metres. Is it possible t

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

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3. The sum of the first three numbers in an Arithmetic Progression is 18. If the product of the first and the third term is 5 times the common difference, find the three numbers.

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4. 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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5. The decorative block is made of two solids a cube and a hemisphere. The base of the block is a cube with edge 5 cm, and the hemisphere fixed on the top has a diameter of 4.2 cm. Find the total surface area of the block.

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6. A decorative block shown in Fig. 16.50 is made of two solids a cube and a hemisphere. The base of the block is a cube with edge 5 cm, and the hemisphere fixed on the top has a diameter 4.2 cm. Find the total surface area of the block (Take $\pi = 22/7$).

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7. A bucket is in form of a frustum of a cone with a copacity of $12308.8cm^3$ of water. The radii of the tope bottom circular ends are 20

cm and 12 cm respectively. Find the height of the bucket and the area of the metal sheet used in its making. [Use $\pi = 3.14$.]

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

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9. Prove that is a right angle triangle, the square of the hypotenuse is equal the sum of the squares of other two sides.

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10. If $1 + \sin^2\theta = 3\sin\theta\cos\theta$, then prove that $\tan\theta = 1$ or $\tan\theta = \frac{1}{2}$.

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12. The shadow of a tower standing on a level ground is found to be 40 m longer when the Suns altitude is $30o$than when it is $60o$. Find the height of the tower.

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