CBSE
Class X Mathematics
Board Paper
Term 1 – 2021

Time: 90 minutes **Total Marks: 40**

General Instructions:

Read the following instructions very carefully and strictly follow them:

(i) *This question paper contains **50** questions out of which **40** questions are to be attempted. As per instructions. All questions carry equal marks.*

(ii) *The Question Paper consists of three sections- Section A, Section B and Section C.*

(iii) *Section A consists of **20** questions. Attempt any **16** questions from Q.No. **1** to **20**.*

(iv) *Section B also contains **20** questions. Attempt any **16** questions from Q.No. **21** to **40**.*

(v) *Section C consists of **10** questions. Attempt any **8** questions from Q.No. **41** to **50**.*

(vi) *There is only **one** correct option for every multiple choice question (MCQ). Marks will not be awarded for answering more than one option.*

(vii) *There is **no** negative marking.*

SECTION A

Question numbers **1** to **20** are multiple choice questions of **1** mark each.
Select the correct option.

1. If HCF (39, 91) = 13, then LCM (39, 91) is :

A. 91
B. 273
C. 39
D. 3549

2. $4\sqrt{57}$ is a/an :

A. integer
B. rational number
C. natural number
D. irrational number

3. The line represented by 4x - 3y = 9 intersects the y-axis at :

A. (0, - 3)
B. $\left(\frac{9}{4}, 0\right)$
C. (-3,0)

D. $\left(0, \frac{9}{4}\right)$

4. The point on x-axis equidistant from the points P(5, 0) and Q(- 1, 0) is :

A. (2, 0)
B. (- 2, 0)
C. (3, 0)
D. (2, 2)

5. If ΔABC and ΔPQR are similar triangles such that $\angle A = 31°$ and $\angle R = 69°$, then $\angle Q$ is:

A. 70°
B. 100°
C. 90°
D. 80°

6. Given that $\cos\theta = \frac{\sqrt{3}}{2}$, then the value of $\frac{\text{cosec}^2\theta - \sec^2\theta}{\text{cosec}^2\theta + \sec^2\theta}$ is :

A. - 1
B. 1
C. $\frac{1}{2}$
D. $-\frac{1}{2}$

7. The area swept by 7 cm long minute hand of a clock in 10 minutes is:

A. 77 cm^2
B. $12\frac{5}{6}\,cm^2$
C. $7\frac{1}{12}\,cm^2$
D. $25\frac{2}{3}\,cm^2$

8. The probability of getting two heads when two fair coins are tossed together, is:

A. $\frac{1}{3}$
B. $\frac{1}{4}$
C. $\frac{1}{2}$
D. 1

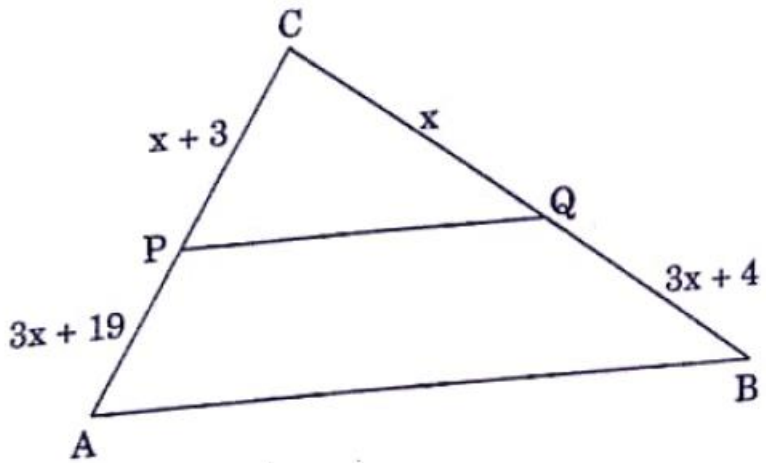
9. Two positive numbers have their HCF as 12 and their product as 6336. The number of pairs possible for the numbers, is :

A. 2
B. 3
C. 4
D. 1

10. The pair of equations y = 2 and y = -3 has

A. one solution
B. Two solutions
C. infinitely many solutions
D. no solutions

11. In the figure given below, what value of x will make PQ || AB?



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

12. Given that $\sin\alpha = \frac{\sqrt{3}}{2}$ and $\tan\beta = \frac{1}{\sqrt{3}}$, then the value of $\cos(\alpha - \beta)$ is :

A. $\frac{\sqrt{3}}{2}$
B. $\frac{1}{2}$
C. 0
D. $\frac{1}{\sqrt{2}}$

13. In a single throw of a die, the probability of getting a composite number is :

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

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

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

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

14. The decimal expansion of the rational number $\frac{3177}{250}$ will terminate after

A. One decimal place
B. two decimal places
C. three decimal places
D. four decimal places

15. The pair of lines represented by the linear equations $3x + 2y = 7$ and $4x + 8y - 11 = 0$ are

A. perpendicular
B. parallel
C. intersecting
D. coincident

16. In an equilateral triangle with length of side p, the length of the altitude is :

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

B. $\frac{\sqrt{3}}{4}P$

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

D. $\frac{\sqrt{3}}{4}P^2$

17. Given that $\sin\theta = \frac{p}{q}$, $\tan\theta$ is equal to :

A. $\frac{p}{\sqrt{p^2 - q^2}}$

B. $\frac{q}{\sqrt{p^2 - q^2}}$

C. $\frac{p}{\sqrt{q^2 - p^2}}$

D. $\frac{q}{\sqrt{q^2 - p^2}}$

18. A vertical pole of length 19 m casts a shadow 57 m long on the ground and at the same time a tower casts a shadow 51 m long. The a height of the tower is:

A. 171m

B. 13 m

C. 17 m

D. 117 m

19. The simplest form of $\sqrt{(1 - \cos^2\theta)(1 + \tan^2\theta)}$ is

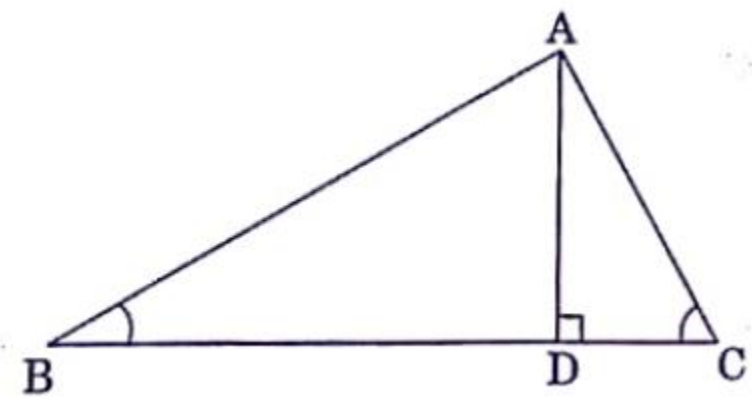
A. cos θ

B. sin θ

C. cot θ

D. tan θ

20. In the given figure, ∠ABC and ∠ ACB are complementary to each other and AD ⊥ BC. Then,



A. $BD.CD = BC^2$

B. $AB.BC = BC^2$

C. $BD.CD = AD^2$

D. $AB.AC = AD^2$

SECTION B

*Questions no. 21 to 40 are of **1** mark each. Answer any **16** questions from Q. No. 21 - 40.*

21. If one of the zeroes of a quadratic polynomial $(k - 1)x^2 + kx + 1$ is -3, then the value of k is:

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

B. $-\frac{4}{3}$

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

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

22. If the lengths of diagonals of a rhombus are 10 cm and 24 cm, then the perimeter of the rhombus is:

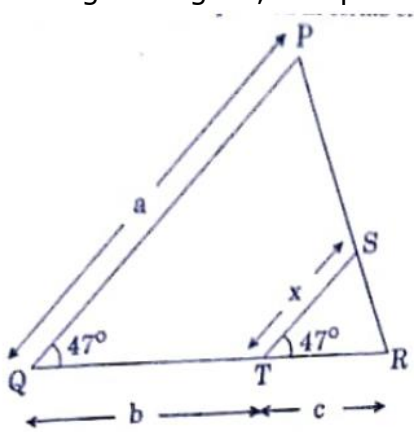
A. 13 cm

B. 26 cm

C. 39 cm

D. 52 cm

23. In the given figure, x expressed in terms of a, b, c, is :



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

B. $x = \frac{ac}{b+c}$

C. $x = \frac{bc}{b+c}$

D. $x = \frac{ac}{a+c}$

24. $\frac{1}{\text{cosec}\,\theta(1-\cot\theta)} + \frac{1}{\sec\theta(1-\tan\theta)}$ is equal to

A. 0
B. 1
C. $\sin\theta + \cos\theta$
D. $\sin\theta - \cos\theta$

25. If 'n' is any natural number, then $(12)^n$ cannot end with the digit:

A. 2
B. 4
C. 8
D. 0

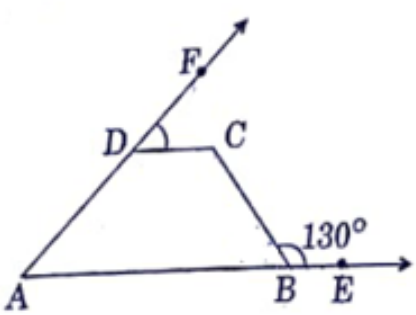
26. A wire can be bent in the form of a circle of radius 56 cm. If the same wire is bent in the form of square, then the area of the square will be:

A. 8800 cm^2
B. 7744 cm^2
C. 6400 cm^2
D. 3520 cm^2

27. The probability that a non-leap year has 53 Wednesday, is :

A. $\frac{1}{7}$
B. $\frac{2}{7}$
C. $\frac{5}{7}$
D. $\frac{6}{7}$

28. If the given figure, points A, B, C and D are concyclic and $\angle CBE = 130°$. Then $\angle FDC$ is :



A. 130°
B. 80°
C. 50°
D. 30°

29. The x – coordinate of a point P is twice its y-coordinate. If P is equidistant from Q(2, -5) and R(-3, 6), then the coordinates of P are :

A. (8, 16)
B. (10, 20)
C. (20, 10)
D. (16, 8)

30. If the point (x, 4) lies on a circle whose centre is at origin and radius is 5 cm, then the value of x is :

A. 0
B. ± 4
C. ± 5
D. ± 3

31. The value of θ for which $2 \sin 2\theta = 1$, is :

A. $15°$
B. $30°$
C. $45°$
D. $60°$

32. The number 385 can be expressed as the product of prime factors as

A. $5 \times 11 \times 13$
B. $5 \times 7 \times 11$
C. $5 \times 7 \times 13$
D. $5 \times 11 \times 17$

33. The difference between circumference and radius of a circle is 111 cm. The area of the circle is

A. 1366 cm^2
B. 1386 cm^2
C. 1376 cm^2
D. 1396 cm^2

34. From the letters of word 'MANGO', a letter is selected at random. The probability that the letter is a vowel, is :

A. $\frac{1}{5}$
B. $\frac{3}{5}$
C. $\frac{2}{5}$
D. $\frac{4}{5}$

35. If $17x - 19y = 53$ and $19x - 17y = 55$, then the value of $(x + y)$ is :

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

36. The ratio in which the point (-4, 6) divides the line segment joining the points A (-6, 10) and B(3, -8) is :

A. 2:5
B. 7:2
C. 2:7
D. 5:2

37. If $\sin^2\theta + \sin\theta = 1$, then the value of $\cos^2\theta + \cos^4\theta$ is :

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

38. The decimal expression of $\frac{43}{162}$:

A. is terminating
B. is non-terminating and non-recurring
C. is non-terminating and recurring
D. does not exist

39. If the circumference of a circle is tripled, then its area becomes:

A. three times
B. nine times
C. eight times
D. two times

40. A father is three times as old as his son. In 12 years time, he will be twice as old as his son. The sum of the present ages of the father and the son is:

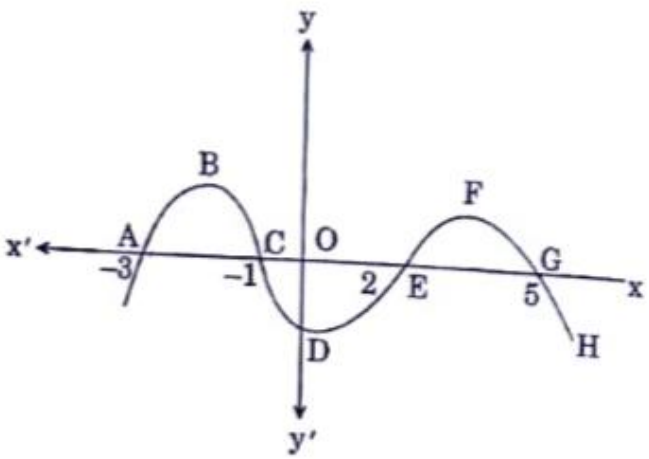
A. 36 years
B. 48 years
C. 60 years
D. 42 years

SECTION C
(Case Study Based Questions)

*Section C consists of **10** questions of 1 mark each. Attempt any **8** questions from Q. No. **41 – 50**.* *8 × 1 = 8*

(Case Study – I)

A car moves on a highway. The path it traces is given below:



Based on the above information, answer the following questions:

41. What is the shape of the curve EFG?

A. Parabola
B. Ellipse
C. Straight line
D. Circle

42. If the curve ABC is represented by the polynomial $-(x^2 + 4x + 3)$, then its zeroes are:

A. 1 and -3
B. -1 and 3
C. 1 and 3
D. -1 and -3

43. If the path traced by the car has zeroes at -1 and 2, then it is given by:

A. $x^2 + x + 2$
B. $x^2 - x + 2$
C. $x^2 - x - 2$
D. $x^2 + x - 2$

44. The number of zeroes of the polynomial representing the whole curve, is:

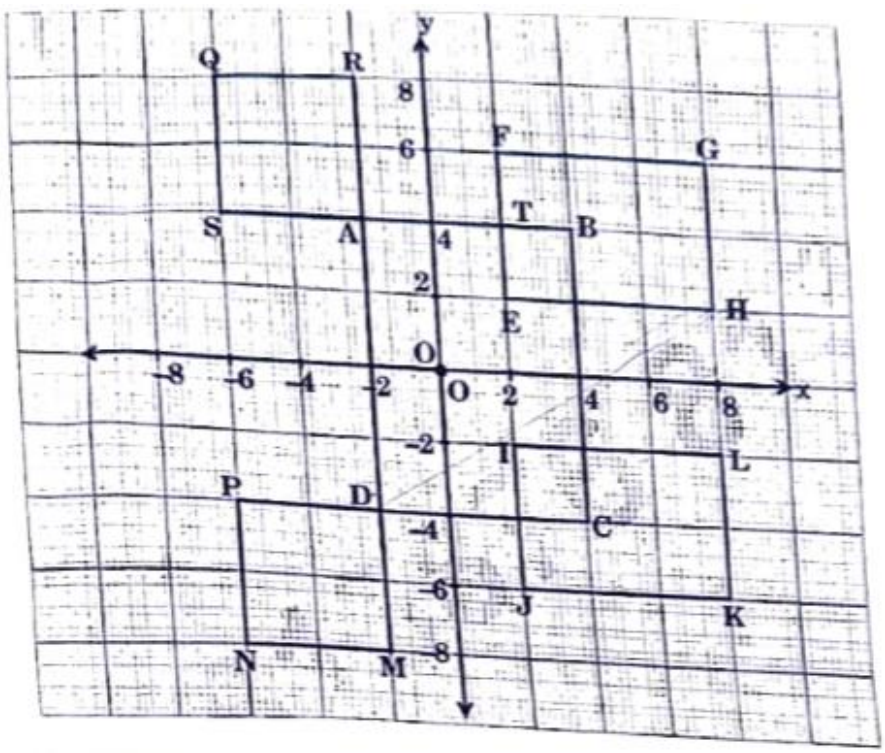
A. 4
B. 3
C. 2
D. 1

45. The distance between C and G is:

A. 4 units
B. 6 units
C. 8 units
D. 7 units

(Case Study – II)

Shivani is an interior decorator. To design her own living room, she designed wall shelves. The graph of intersecting wall shelves is given below:



Based on the above information, answer the following questions:

46. If O is the origin, then what are the coordinates of S?

A. (-6, -4)
B. (6, 4)
C. (-6, 4)
D. (6, -4)

47. The coordinates of the mid-point of the line-segment joining D and H is:

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

B. (3, -1)

C. (3, 1)

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

48. The ratio in which the x-axis divides the line-segment joining the points A and C, is:

A. 2 : 3

B. 2 : 1

C. 1 : 2

D. 1 : 1

49. The distance between the points P and G is

A. 16 units

B. $3\sqrt{74}$ units

C. $2\sqrt{74}$ units

D. $\sqrt{74}$ units

50. The coordinates of the vertices of rectangle IJKL are:

A. I(2, 0), J(2, 6), K(8, 6), L(8, 2)

B. I(2,-2), J(2, -6), K(8, -6), L(8, -2)

C. I(-2, 0), J(-2, 6), K(-8, 6), L(-8, 2)

D. I(-2, 0), J(-2, -6), K(-8, -6), L(-8, -2)

Solution

SECTION A

1. Correct Option: B
Product of numbers = LCM×HCF
$\therefore 39\times91=LCM\times13$
$\therefore LCM=273$

2. Correct Option: D
The product of any rational number and any irrational number will always be an irrational number. Here $\sqrt{57}$ is irrational, hence is $4\sqrt{57}$ an irrational number.

3. Correct Option: A
Substituting x = 0 in 4x - 3y = 9, we get y = -3, hence the point is (0,-3).

4. Correct Option: A
A point on x-axis will have coordinates (x,0).
Now let A(x,0) is equidistant from the points P(5, 0) and Q(- 1, 0), all of which lie on the x-axis, thus we can say that PA = QA and A is the midpoint.
Hence,
$\therefore x=\frac{5-1}{2}=2$
$\therefore \text{Point}=(2,0)$

5. Correct Option: D
ΔABC and ΔPQR are similar triangles
Hence by c.p.c.t.
$\angle A = \angle P$
$\angle B = \angle Q$
$\angle C = \angle R$
Also in ΔABC
$\angle A + \angle B + \angle C = 180^{o}$
$\therefore \angle A + \angle Q + \angle R = 180^{o}$
$\therefore \angle Q = 80^{o}$

6. Correct Option: C

$\cos\theta = \frac{\sqrt{3}}{2}$

$\therefore \theta = 30°$

$\therefore \frac{\text{cosec}^2\theta - \sec^2\theta}{\text{cosec}^2\theta + \sec^2\theta} = \frac{4 - \frac{4}{3}}{4 + \frac{4}{3}} = \frac{8}{16} = \frac{1}{2}$

7. Correct Option: D

60 mins of clock = 360°

10 mins of clock = 60°

Now for the sector,

Radius = 7cm

$\therefore$ Area of sector = $\frac{\theta}{360} \times \pi r^2$

$= \frac{60}{360} \times 7^2 \times \frac{22}{7} = 25\frac{2}{3}\text{cm}^2$

8. Correct Option: B

Two coins are tossed, hence sample space S is

S = {HH, TT, HT, TH}, n(S)=4

A: getting two heads

A = {HH}, n(A)=1

P(A) = n(A)/n(S) = 1/4

9. Correct Option: A

Let the numbers be 12x and 12y, where x and y are co-primes.

Product of the numbers = 144xy

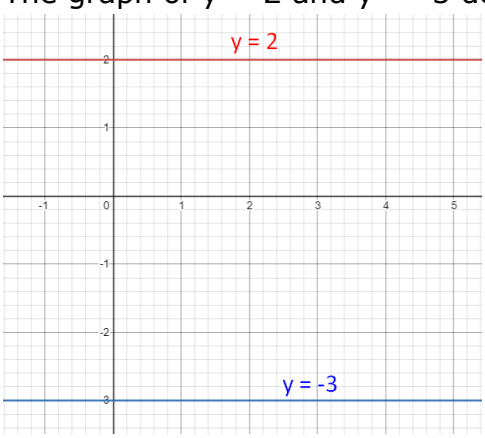
144xy = 6336

xy = 44

Hence two numbers can be 1 and 44, or 11 and 4.

10. Correct Option: D

The graph of y = 2 and y = -3 does not intersect, hence no solution.



11. Correct Option: A

By converse of Basic proportionality theorem,

PQ || AB if,

$$\frac{CP}{PA} = \frac{CQ}{QB}$$

$$\therefore \frac{x+3}{3x+19} = \frac{x}{3x+4}$$

$$\therefore (x+3)(3x+4) = x(3x+19)$$

$$\therefore 3x^2 + 4x + 9x + 12 = 3x^2 + 19x$$

$$\therefore 12 = 6x$$

$$\therefore x = 2$$

12. Correct Option: A

$$\sin 60 = \frac{\sqrt{3}}{2}$$

$$\therefore \alpha = 60$$

$$\tan = \frac{1}{\sqrt{3}}$$

$$\therefore \beta = 30$$

$$\therefore \cos(\alpha - \beta) = \frac{\sqrt{3}}{2}$$

13. Correct Option: A

A die is thrown, hence sample space S is given by

S= {1, 2, 3, 4, 5, 6}, n(S) = 6

A: number is composite

A= {4,6}, n(A) = 2

P(A) = 2/6 = 1/3

14. Correct Option: C

The denominator 250 can be expressed as 2×5^3 (powers of 2 and 5 only), here highest power is 3, and thus decimal will terminate after 3 places.

15. Correct Option: C

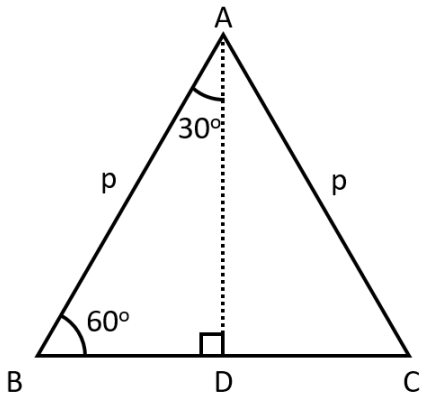
For 3x + 2y = 7 and 4x + 8y = 11

3/4 ≠ 2/8

So, intersecting.

16. Correct Option: A

Let ΔABC be equilateral, with AD altitude



Now ΔABD is right angled triangle,

Hence,

$$\sin 60 = \frac{AD}{AB}$$

$$\therefore \frac{\sqrt{3}}{2} = \frac{AD}{p}$$

$$\therefore AD = \frac{\sqrt{3}}{2}p$$

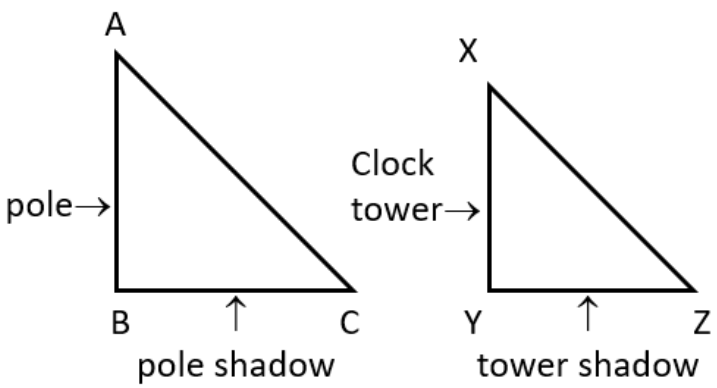
17. Correct Option: C

$$\sin\theta = \frac{p}{q}$$

$$\therefore \cos\theta = \sqrt{1 - \frac{p^2}{q^2}} = \sqrt{\frac{q^2 - p^2}{q^2}}$$

$$\therefore \tan\theta = \frac{\frac{p}{q}}{\sqrt{\frac{q^2 - p^2}{q^2}}} = \frac{p}{\sqrt{q^2 - p^2}}$$

18. Correct Option: C



In ΔABC and ΔXYZ

$\angle B = \angle Y = 90^\circ$

$\angle A = \angle X \ldots (\text{sun's rays})$

$\therefore \Delta ABC \sim \Delta XYZ \ldots (\text{AA test})$

$\therefore \frac{AB}{XY} = \frac{BC}{YZ}$

$\therefore \frac{19}{57} = \frac{BC}{51}$

$\therefore BC = 17m$

19. Correct Option: D

$\sqrt{(1-\cos^2\theta)(1+\tan^2\theta)}$

$= \sqrt{\sin^2\theta \times \sec^2\theta}$

$= \sin\theta \times \frac{1}{\cos\theta}$

$= \tan\theta$

20. Correct Option: C

$\angle ABC$ and $\angle ACB$ are complementary

Hence, $\angle ABC + \angle ACB = 90^\circ$

In ΔABC

$\angle ABC + \angle ACB + \angle BAC = 180^\circ$ …(sum of angles of triangle)

$\therefore \angle BAC = 90^\circ$

So in right angled triangle BAC, a perpendicular is drawn to the hypotenuse from the 90° vertex, hence we have

$\Delta BAC \sim \Delta BDA \sim \Delta ADC$

$\Delta BDA \sim \Delta ADC$

$\frac{BD}{AD} = \frac{AD}{CD} \ldots (\text{c.p.c.t.})$

$BD.CD = AD^2$

SECTION B

*Questions no. 21 to 40 are of **1** mark each. Answer any **16** questions from Q. No. 21 - 40.*

21. Correct Option: A

$(k - 1)x^2 + kx + 1$

One of the zeros is -3

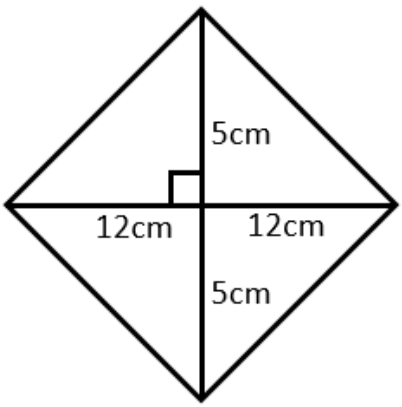
$\therefore (k - 1)9 - 3k + 1 = 0$

$\therefore 9k - 9 - 3k + 1 = 0$

$\therefore k = 4/3$

22. Correct Option: D

Diagonals of rhombus bisect each other perpendicularly

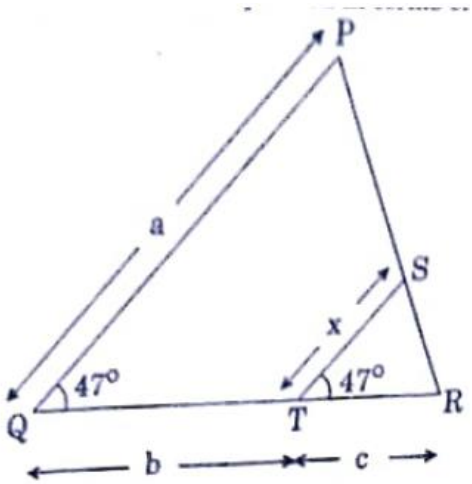


Hence,

$\text{side} = \sqrt{5^2 + 12^2} = 13\text{cm}$

$\text{Perimeter} = 13 \times 4 = 52\text{cm}$

23. Correct Option: B



In ΔQRP and ΔTRS

$\angle PQR = \angle STR \ldots (\text{given})$

$\angle R \ldots (\text{common})$

$\Delta QRP \sim \Delta TRS \ldots (\text{AA test})$

$\therefore \frac{QR}{TR} = \frac{QP}{TS} \ldots (\text{c.p.c.t.})$

$\therefore \frac{b+c}{c} = \frac{a}{x}$

$\therefore x = \frac{ac}{b+c}$

24. Correct Option: C

$$\frac{1}{\operatorname{cosec}\theta(1-\cot\theta)}+\frac{1}{\sec\theta(1-\tan\theta)}$$

$$=\frac{1}{\frac{1}{\sin\theta}\left(1-\frac{\cos\theta}{\sin\theta}\right)}+\frac{1}{\frac{1}{\cos\theta}\left(1-\frac{\sin\theta}{\cos\theta}\right)}$$

$$=\frac{1}{\frac{1}{\sin\theta}\left(\frac{\sin\theta-\cos\theta}{\sin\theta}\right)}+\frac{1}{\frac{1}{\cos\theta}\left(\frac{\cos\theta-\sin\theta}{\cos\theta}\right)}$$

$$=\frac{\sin^2\theta}{\sin\theta-\cos\theta}+\frac{\cos^2\theta}{\cos\theta-\sin\theta}$$

$$=\frac{\sin^2\theta}{\sin\theta-\cos\theta}-\frac{\cos^2\theta}{\sin\theta-\cos\theta}$$

$$=\frac{\sin^2\theta-\cos^2\theta}{\sin\theta-\cos\theta}$$

$$=\frac{(\sin\theta-\cos\theta)(\sin\theta+\cos\theta)}{\sin\theta-\cos\theta}$$

$$=\sin\theta+\cos\theta$$

25. Correct Option: D

$(12)^n = (2^2 \times 3)^n$

Now, to get 0 in the unit's place, you will need 2 as well as 5 in its prime factors.

Thus $(12)^n$ cannot end with 0.

26. Correct Option: B

Circumference of circle = perimeter of square

$2\pi r = 4 \times \text{side}$

$$\therefore \text{side} = \frac{2\times\frac{22}{7}\times 56}{4} = 88\text{cm}$$

$\therefore$ Area $= 88^2 = 7744\text{cm}^2$

27. Correct Option: A

A non-leap year has 52 weeks and 1 day, hence the sample space S will be

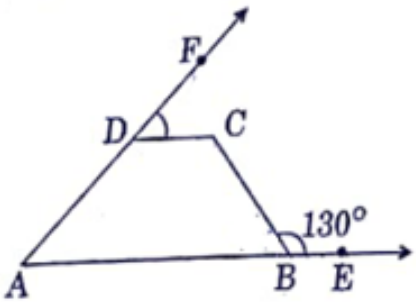
S = {M, T, W, Th, F, Sa, S}, n(A) =7

A: getting extra Wednesday

A = {W}, n(A)=1

P(A) = 1/7

28. Correct Option: C



$\angle ABC + \angle CBE = 180^o$...(linear pair)
$\therefore \angle ABC = 50^o$
Quadrilateral ABCD is cyclic, hence
$\angle ABC + \angle CDA = 180^o$...(opposite angles are supplementary)
$\therefore \angle CDA = 130^o$
$\angle CDA + \angle CDF = 180^o$...(linear pair)
$\therefore \angle ADC = 50^o$

29. Correct Option: D
Let the coordinates of P be (2t,t).
If P is equidistant from Q(2, -5) and R(-3, 6), hence
PQ = PR

$$\sqrt{(2t-2)^2+(t+5)^2} = \sqrt{(2t+3)^2+(t-6)^2}$$

$$\therefore (2t-2)^2+(t+5)^2 = (2t+3)^2+(t-6)^2$$

$$\therefore 4t^2-8t+4+t^2+10t+25 = 4t^2+12t+9+t^2-12t+36$$

$$\therefore -8t+4+10t+25 = 9+36$$

$$\therefore 2t = 16$$

$$\therefore t = 8$$

$$\therefore P(16,8)$$

30. Correct Option: D
Radius of a circle is the distance between a point on its circumference and its center

$$\text{Radius} = \sqrt{(x-0)^2+(4-0)^2}$$

$$\therefore 5 = \sqrt{x^2+4^2}$$

$$\therefore 25 = x^2+4^2$$

$$\therefore x = \pm 3\text{cm}$$

31. Correct Option: A
$2 \sin 2\theta = 1$
$\therefore \sin 2\theta = 1/2$
But $\sin 30 = 1/2$
$\therefore 2\theta = 30^o$
$\therefore \theta = 15^o$

32. Correct Option: B

385 can be expressed as $5\times7\times11$

33. Correct Option: B

$\text{Circumference} - \text{Radius} = 2\pi r - r$

$\therefore 2\pi r - r = 111$

$\therefore r = \frac{111}{2\pi - 1}$

$\therefore r = \frac{111}{2\times\frac{22}{7} - 1}$

$\therefore r = 21\text{cm}$

$\therefore \text{Area} = \frac{22}{7}\times 21^2 = 1386\text{cm}^2$

34. Correct Option: C

S: Selecting letters of word 'MANGO'

S = {M, A, N, G, O}, n(S) = 5

A: Selecting a vowel from letters of word 'MANGO'

A = {A, O}, n(A) = 2

P(A) = 2/5

35. Correct Option: A

$17x - 19y = 53$ ...(1)

$19x - 17y = 55$ ...(2)

Eqn.(2) – eqn.(1) gives

$\therefore 2x + 2y = 2$

$\therefore x + y = 1$

36. Correct Option: C

Let point T(-4, 6) divides the line segment joining the points A(-6, 10) and B(3, -8) in the ratio k:1

Hence by section formula

$\therefore -4 = \frac{k\times 3 + 1\times -6}{k+1}$

$\therefore -4k - 4 = 3k - 6$

$\therefore k = \frac{2}{7}$

37. Correct Option: B

$\sin^2\theta + \sin\theta = 1 \ldots (1)$

$\sin\theta = 1 - \sin^2\theta$

$\sin\theta = \cos^2\theta$

Substitute in (1)

$\therefore \cos^4\theta + \cos^2\theta = 1$

38. Correct Option: B

$\frac{43}{162} = 0.265432.....$

Hence, non-terminating and non-recurring.

39. Correct Option: B

Circumference $= 2\pi r$

New circumference $= 2\pi R$

$\therefore 3 \times 2\pi r = 2\pi R$

$\therefore R = 3r$

Area $= \pi r^2$

$\therefore$ New area$=\pi R^2 = 9\pi r^2$

40. Correct Option: B

Let father's present age be x and son's present age be y

Given,

x = 3y

After 12 years

x + 12 = 2(y + 12)

x – 2y = 12

$\therefore$3y – 2y = 12

$\therefore$y = 12 and x = 36

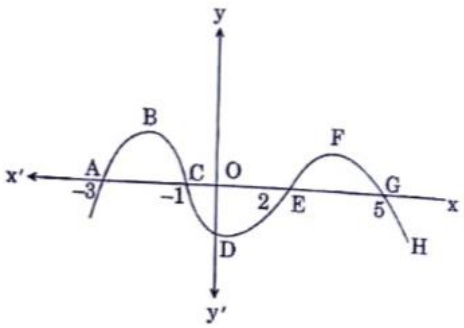
$\therefore$Sum = 48

SECTION C
(Case Study Based Questions)

*Section C consists of **10** questions of 1 mark each. Attempt any **8** questions from Q. No. **41 – 50**.* *8 × 1 = 8*

(Case Study – I)

41. Correct Option: A



Curve EFG denotes a parabola

42. Correct Option: D

$-(x^2 + 4x + 3)=0$

$\therefore x^2 + 4x + 3 =0$

$\therefore x(x+3)+1(x+3)=0$

$\therefore (x+1)(x+3)=0$

$\therefore x = -1$ or $x = -3$

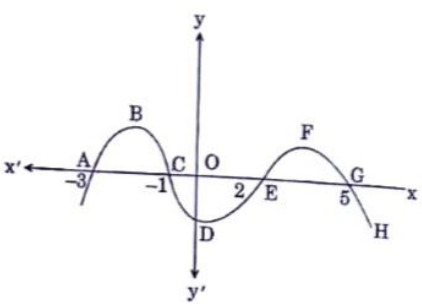
43. Correct Option: C

Zeroes are -1 and 2, hence, the polynomial is given by

x^2 – (sum of roots)x + (product of roots) = 0

$\therefore x^2 – x - 2 = 0$

44. Correct Option: A



The polynomial cuts x-axis at 4 points hence it has 4 roots.

45. Correct Option: B
C and G lies on x-axis, hence distance between them = |difference of their x-coordinates|
$\therefore$ Distance = |-1 – 5|=6 units

(Case Study – II)

46. Correct Option: C
Coordinates of S is (-6,4)

47. Correct Option: B
Mid-point of the line-segment joining D(-2,-4) and H(8,2) is given by
$\left(\frac{-2+8}{2}, \frac{-4+2}{2}\right) = (3,-1)$

48. Correct Option: D
Let point (t,0) divides the line-segment joining the points A(-2,4) and C(4,-4), in ratio k:1
Hence by section formula,
$0 = \frac{k \times -4 + 1 \times 4}{k+1}$
$\therefore 0 = -4k + 4$
$\therefore k = 1$
$\therefore$ Ratio is 1:1

49. Correct Option: C
Distance between P(-6,-4) and G(8,6) is given by
$\sqrt{(8+6)^2 + (6+4)^2}$
$= 2\sqrt{74}$ units

50. Correct Option: B
The coordinates of the vertices of rectangle IJKL are I(2,-2), J(2, -6), K(8, -6), L(8, -2).