Maths FULL Portion Test 9/3/23

All subjects ICSE : Mathematics

Q. 1 Which of the following is not a quadratic equation?

- $2(x-1)^2 = 4x^2 - 2x + 1$
- $2x - x^2 = x^2 + 5$
- $\left(\sqrt{2}x + \sqrt{3}\right)^2 = 3x^2 - 5x$
- $\left(x^2 + 2x\right)^2 = x^4 + 3 + 4x^2$

Q. 2 The value of k for which the quadratic equation kx (x – 2) + 6 = 0 has two equal roots:

- 4
- 8
- 6
- 16

Q. 3 $A = \begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$ Then A^3 is

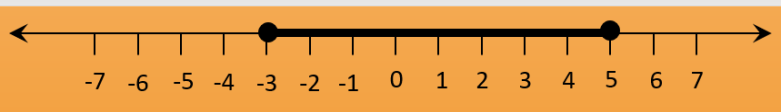
- $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$
- $\begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$
- $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$
- $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$

Q. 4 If $A = \begin{bmatrix} 2 & 1 \\ 4 & 2 \end{bmatrix}$, $B = \begin{bmatrix} 3 & 4 \\ -1 & -2 \end{bmatrix}$, $C = \begin{bmatrix} -3 & 1 \\ 0 & -2 \end{bmatrix}$,

then the matrix ACB is

- $\begin{bmatrix} -15 & -7 \\ -30 & -14 \end{bmatrix}$
- $\begin{bmatrix} -18 & -24 \\ -36 & -48 \end{bmatrix}$
- $\begin{bmatrix} -28 & -35 \\ -40 & -18 \end{bmatrix}$
- $\begin{bmatrix} -13 & -22 \\ -29 & -46 \end{bmatrix}$

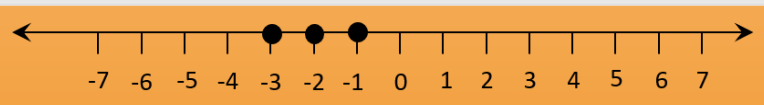
Q. 5



The number line above represents the solution to the inequation:

- $-3 < x < 5, x \in R$
- $-3 \leq x \leq 5, x \in Z$
- $-3 < x < 5, x \in Z$
- $-3 \leq x \leq 5, x \in R$

Q. 6



The above diagram represents the solution set of the equation:

- $x - 3(2 + x) < 2(3x - 1),\ x \in \{-3, -2, -1, 0, 1, 2, 3\}$
- $x - 3(2 + x) > 3(2x - 1),\ x \in \{-3, -2, -1, 0, 1, 2, 3\}$
- $x - 3(2 + x) > 2(3x + 1),\ x \in \{-3, -2, -1, 0, 1, 2, 3\}$

Q. 7 If (x + 5) is the mean proportion between (x + 2) and (x + 9), then the value of x is:

- 6
- 7
- 15/2
- 8

Q. 8 When $4x^2 + 5x + 3$ is divided by (2x + 1), the remainder is:

- -3
- 3
- 3/2
- -3/2

Q. 9 If (2x + 1) is a factor of $6x^3 + 5x^2 + ax - 2$, the value of 'a' is:

- -3
- -6
- 8

Q. 10 If (x - 2) is a factor of $2x^3 - x^2 + px - 2$, the value of 'p' is:

- 11
- -3
- -5
- 8

Q. 11 If (x + 4) is a factor of the polynomial $x^2 - x - (2 + k)$ then value of k is

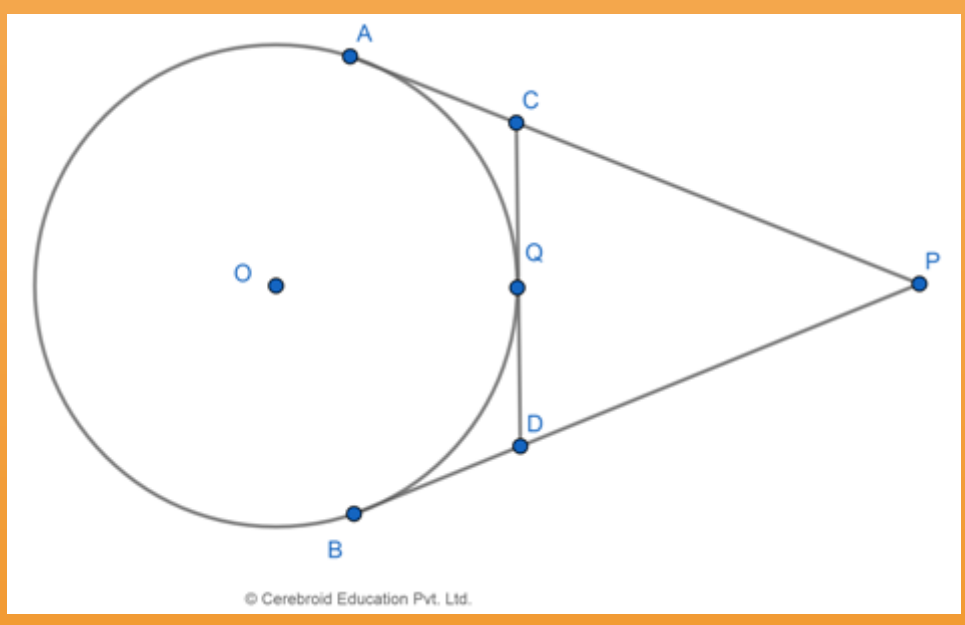
- 18

- 9
- 6
- -9

Q. 12 The 25th term of the A.P. -4, -7, -10, ... is:

- -76
- -79
- -73
- -75

Q. 13 In the given figure PA and PB are tangents to the circle from an external point P. CD is another tangent touching the circle at Q. If PA = 12 cm, QC = DQ = 3 cm, then PC + PD =

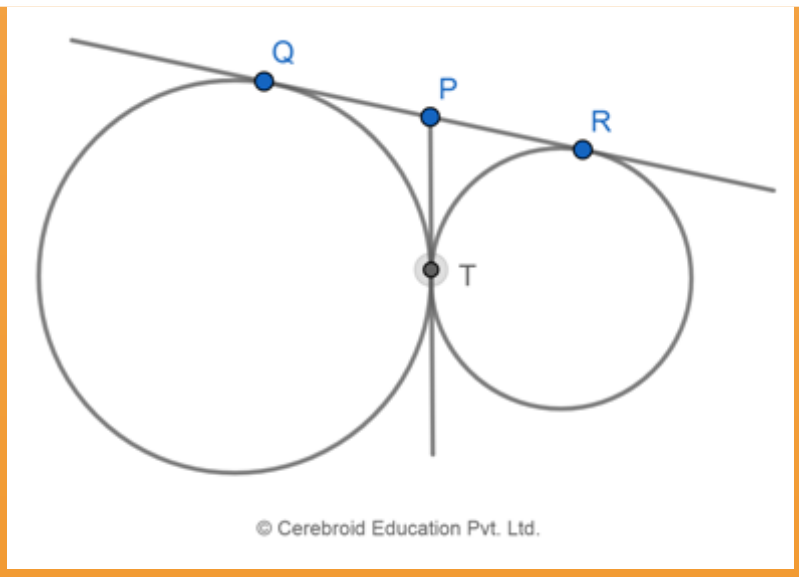


- 9 cm
- 12 cm
- 15 cm
- 18 cm

Q. 14 The length of a tangent drawn from a point 8 cm away from the centre of a circle of diameter 12 cm is:

- $3\sqrt{7}\ cm$
- $4\ cm$
- $2\sqrt{7}\ cm$
- 6 cm

Q. 15 In the figure, QR is a common tangent to the given circles, touching externally at point T. The tangent at T meets QR at P. If PT = 3.8 cm, then the length of QR is

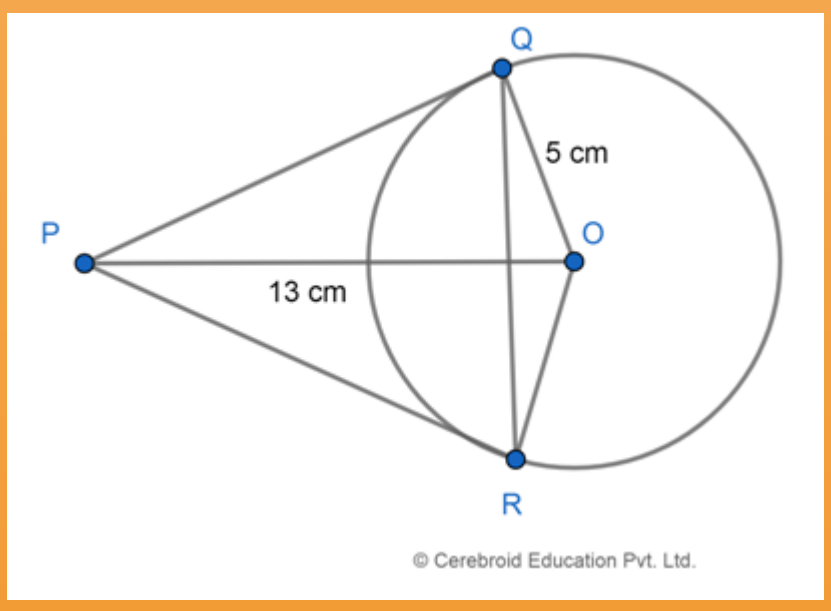


- 3.8 cm
- 7.6 cm
- 5.7 cm
- 1.9 cm

Q. 16 A tangent PQ at a point P of a circle of radius 5 cm meets a line through the centre O at point Q so that OQ = 12 cm. Length PQ is:

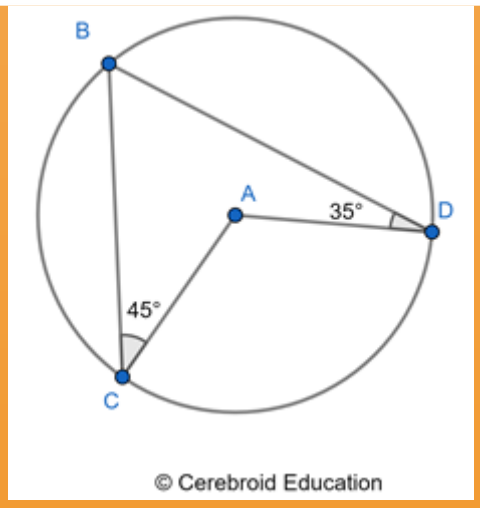
- 12 cm
- 13 cm
- 8.5 cm
- $\sqrt{119}\ cm$

Q. 17 From a point P which is at a distance of 13 cm from the centre O of a circle of radius 5 cm, the pair of tangents PQ and PR to the circle are drawn. Then the area of the quadrilateral PQOR is:



- 60 cm^2
- 65 cm^2
- 30 cm^2
- 32.5 cm^2

Q. 18 In the figure, A is the centre of the circle. ∠BCA = 45° and ∠BDA = 35°. Then ∠CAD =



- 140°
- 160°
- 120°
- 135°

Q. 19 In what ratio is the line segment joining X (0, 3) and Y (4, -1) divided by the x-axis?

- 3 : 1
- 2 : 3
- 4 : 3
- 3 : 2

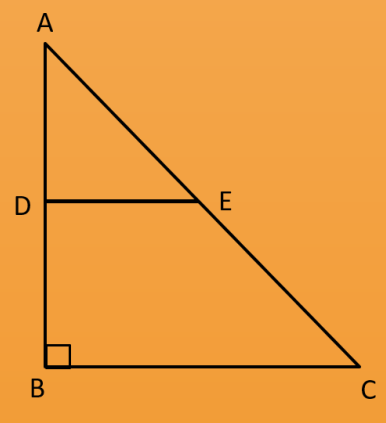
Q. 20 If the lines 3x - 4y + 7 = 0 and 2x + ky + 5 = 0 are perpendicular to each other, then the value of k is:

- 3/2
- -3/2
- 2/3
- -2/3

Q. 21 The line through (-2, 6) and (4, 8) and the line through (8, 12) and (4, 24) are:

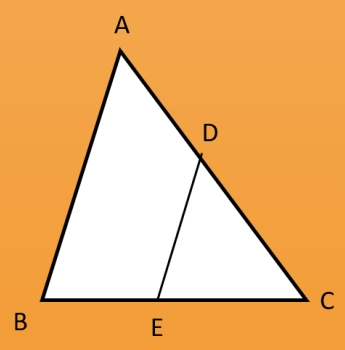
- parallel
- perpendicular
- neither parallel nor perpendicular

Q. 22 In the given figure, ABC is a right angled triangle right angled at B. DE || BC, AB = 6 cm, AE = 4 cm, AD : DB = 1 : 2. Then AC =



- 12 cm
- 6√3 cm
- 6√2 cm
- 10 cm

Q. 23 In the figure of ΔABC, DE || AB. If AD = 2x, DC = x + 3, BE = 2x - 1 and CE = x, then the value of x is:



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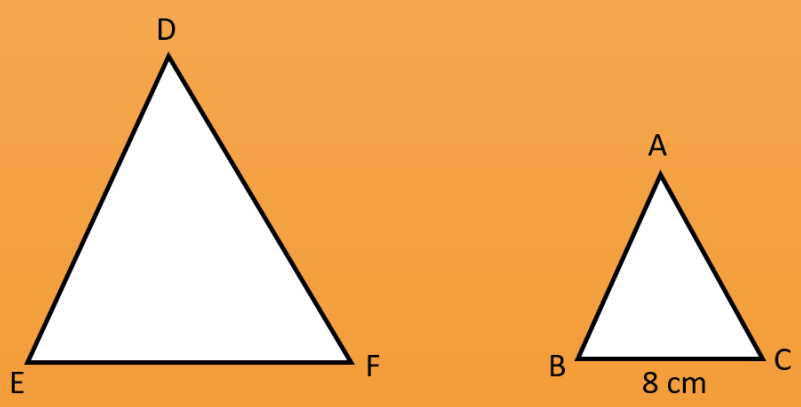
- $\frac{3}{5}$
- $\frac{5}{3}$
- $\frac{2}{5}$
- $\frac{5}{2}$

Q. 24 If ΔABC~ΔDEF such that 3AB = 2DE and BC = 8 cm, then EF =



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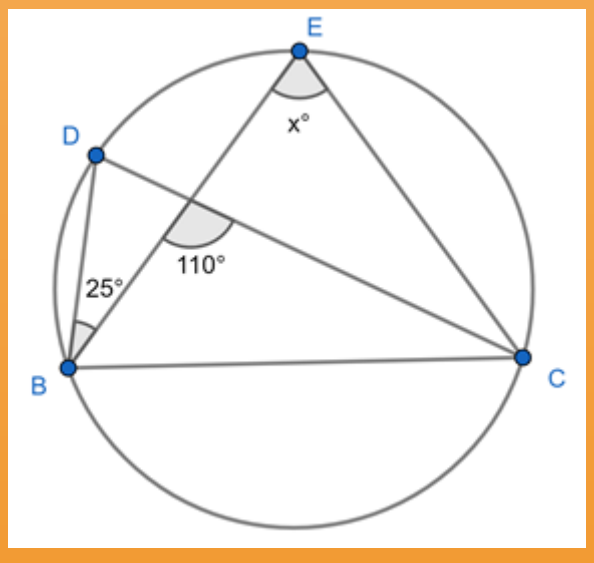
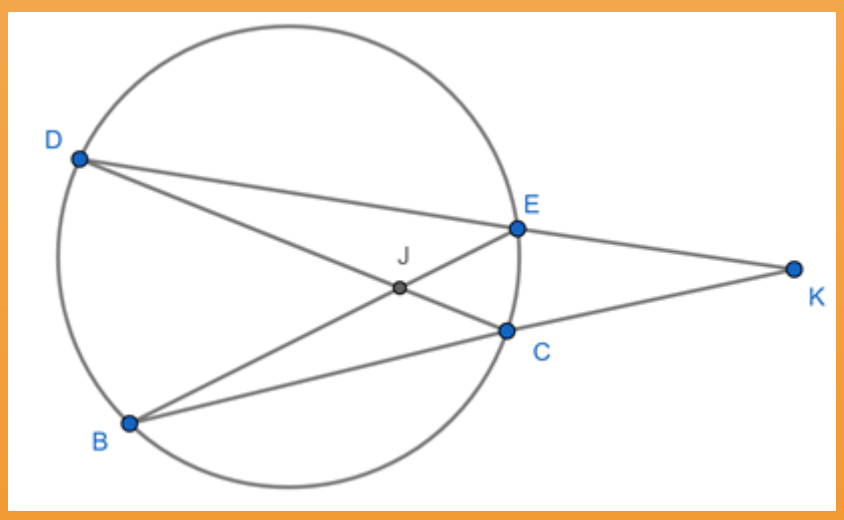
- 12 cm
- 4 cm
- 16 cm
- 9 cm

Q. 25 In the following figure the value of x is:



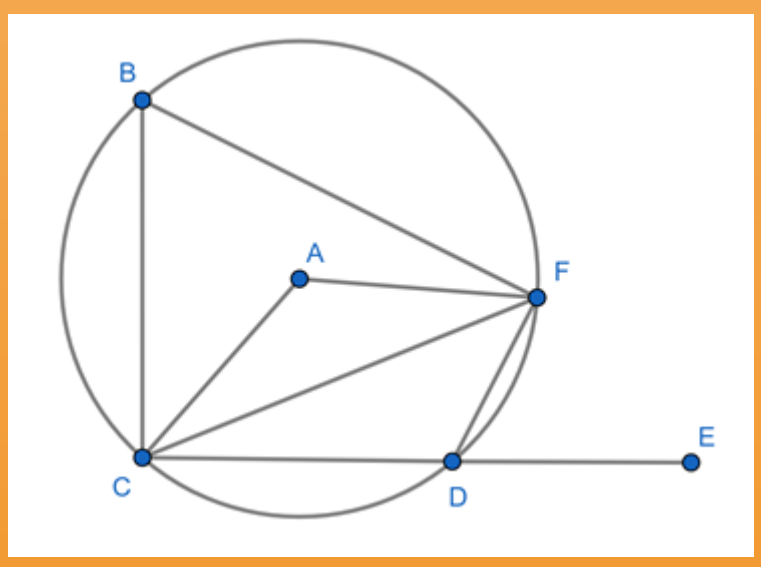
- 70°
- 85°
- 55°
- 65°

Q. 26 In the figure below the chords BC and DE of the circle have been extended to meet at point I outside the circle. Which of the following statements are true?



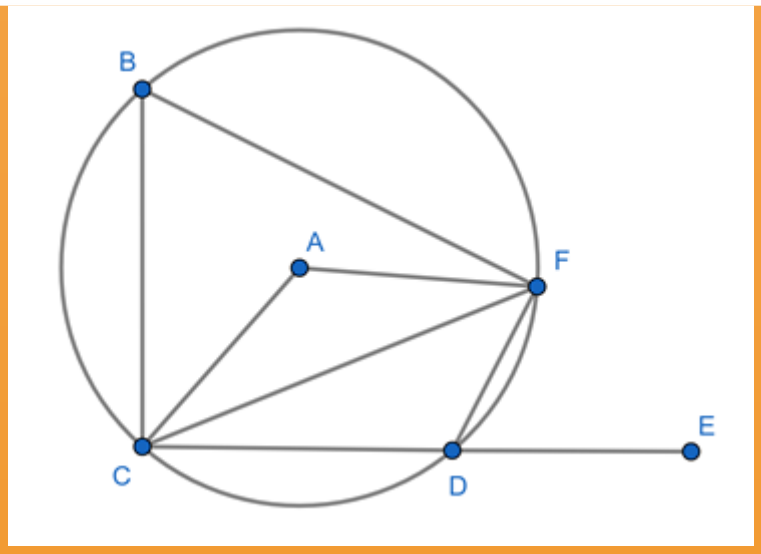
- ΔKCD ~ ΔKEB
- ΔDJE ~ ΔBJC
- DE = BC
- KC = KE

Q. 27 In the given figure, A is the centre of the circle. ∠FDE = 64°. Then ∠CBF =



- 64°
- 32°
- 46°
- 26°

Q. 28 In the given figure, A is the centre of the circle. ∠FDE = 64°. Then ∠CAF =



- 128°
- 116°
- 132°
- 140°

Q. 29 A bag contains cards numbered from 1 to 25. A card is drawn at random from the bag. The probability that the number on this card is divisible by both 2 and 3 is:

- 1/5
- 3/25
- 4/25
- 2/25

Q. 30 From the numbers 3, 5, 5, 7, 7, 7, 9, 9, 9, 9, one number is selected at random. The probability that the selected number is the mean of the numbers is:

- 1/5
- 3/10
- 0
- 1/10

Q. 31 The angle of depression of a car parked on the road from the top of a 150 m high tower is 30°. The distance of the car from the base of the tower (in metres) is:

- 50√3
- 150√3
- 50√2
- 75

Q. 32 A and B are standing on ground 50 meters apart. The angles of elevation for these two to the top of a tree are 60° and 30°. What is height of the tree?

- 50√3 m
- 25√3 m
- $\frac{25}{\sqrt{3}}\ m$
- $25\left(\sqrt{3}-1\right)\ m$

Q. 33 A hemispherical bowl of internal radius 12 cm contains a liquid. This liquid is to be filled into cylindrical containers of diameter 4 cm and height 3 cm. The number of containers necessary to empty the bowl is:

- 80
- 96
- 100
- 112

Q. 34 The radii of the bases of two cylinders are in the ratio 3 : 4 and their heights are in the ratio 4 : 3. The ratio of their volume is:

- 2 : 3
- 3 : 2
- 3 : 4
- 4 : 3

Q. 35 The volume of a right circular cylinder, 14 cm in height, is equal to that of a cube whose edge is 11 cm. The base radius of the cylinder is:

$[\pi = 22/7]$

- 2.75 cm
- 5.5 cm
- 11 cm
- 22 cm

Q. 36 P(0, 5) is invariant under:

- reflection in x-axis
- reflection in y-axis
- reflection in the origin
- reflection in x = 5

Q. 37 $\frac{5}{sec^2\theta} + \frac{2}{1+cot^2\theta} + 3\sin^2\theta =$

- 2
- 3
- 4
- 5

Q. 38 $\frac{\sin A}{1+\cos A} + \frac{\sin A}{1-\cos A} =$

- 2cosec A

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