# Techior Solutions Pvt. Ltd.

**SSC X Mathematics (II)**

Total Time: 2 Hr | Total Marks: 40.0

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## Mathematics - II

**Write the correct alternative :** **5 × 1=5**

**1)** If point (x, y) is equidistant from (7, 1) and (3, 5) then **1**

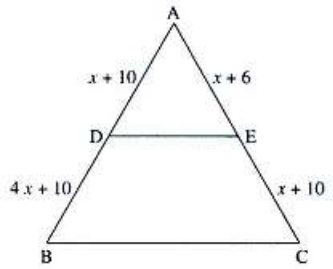
**A)** $y = x - 2$

**B)** $x = y - 2$

**C)** $x + y = 2$

**D)** None of these

**2)** In the figure, for what value of x will seg DE be parallel to AB? **1**




**A)** 2

**B)** 3

**C)** 20

**D)** 2 and 20

**3)** Find the volume of a cube of side 0.01 cm. **1**

**A)** 1 $cm^3$

**B)** 0.001 $cm^3$

**C)** 0.0001 $cm^3$

**D)** 0.000001 $cm^3$

**4)** A conical tent is to accommodate 11 persons such that each person occupies 4 $m^2$ of space on the ground. They have 220 $m^3$ of air to breathe. The height of the cone is **1**

**A)** 15 m

**B)** 4 m

**C)** 20 m

**D)** 22 m

**5)** Find perimeter of a square if its diagonal is $10\sqrt{2}$ cm **1**

**A)** 10 cm

**B)** $40\sqrt{2}$ cm

**C)** 20 cm

**D)** 40 cm

**Answer the following :** **5 × 1=5**

**6)** Theorem: If two points on a given line subtend equal angles at two distinct points which lie on the same side of the line, then the four points are concyclic. **1**

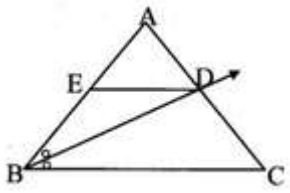
The above theorem is converse of a certain theorem. State it.

**7)** Find the slopes of the lines passing through the given points: **1**

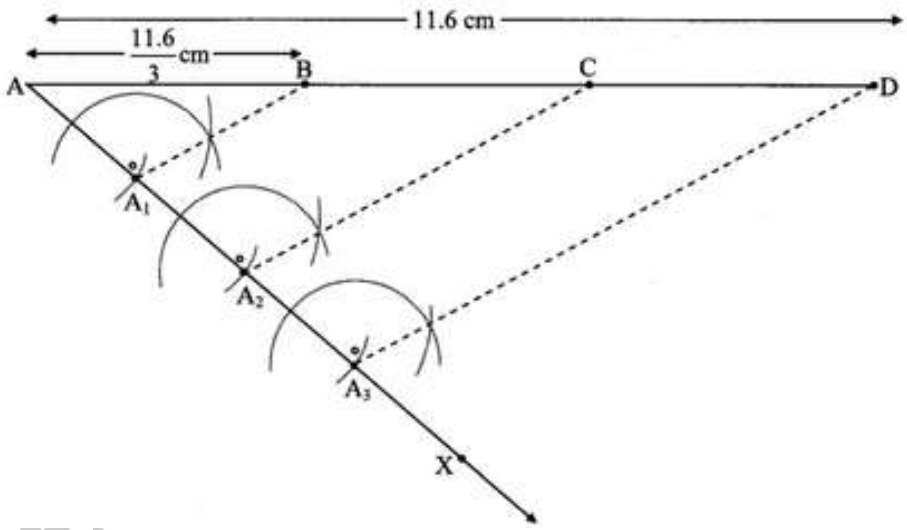
L(−2, −3), M(−6, − 8)

**8)** In ΔABC, ray BD bisects ∠ABC. A – D – C, side DE || side BC, A – E – B, then prove that **1**

$\frac{AB}{BC} = \frac{AE}{EB}$




**9)** If length of side AB is $\frac{11.6}{3}$ cm, then by dividing the line segment of length 11.6 cm in three equal parts, draw segment AB. **1**

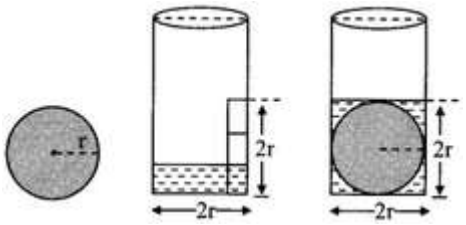



**10)** Draw seg AB of length 4.2 cm. Construct its perpendicular bisector. **1**

**Answer the following (any Five) :** **5 × 2=10**

**11)** Finding volume of a sphere using cylindrical beaker and water. **2**

i. Take a ball and a beaker of the same radius.
ii. Cut a strip of paper of length equal to the diameter of the beaker.
iii. Draw two lines on the strip dividing it into three equal parts.
iv. Stick this strip on the beaker straight up from the bottom.
v. Fill the water in the beaker upto the first mark of the strip from bottom.
vi. Push the ball in the beaker so that it touches the bottom.
Observe how much water level rises.
You will notice that the water level has risen exactly upto the total height of the strip. Try to obtain the formula for volume of sphere using the volume of the cylindrical beaker.

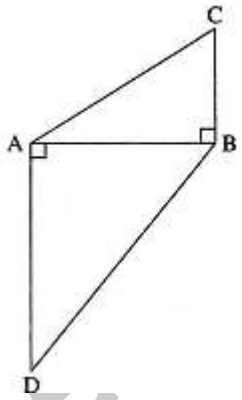



**12)** Determine whether the following points are collinear. **2**

R(1, -4), S(-2, 2), T(-3, 4)

**13)** If figure, $BC \perp AB,\ AD \perp AB$ BC = 4, AD = 8, then find **2**

$$\frac{A(\Delta ABC)}{A(\Delta ADB)}$$




**14)** Radius of a circle is 10 cm. Area of the sector is $100\ cm^2$ . Find the area of its corresponding major sector. $(\pi = 3.14)$ **2**

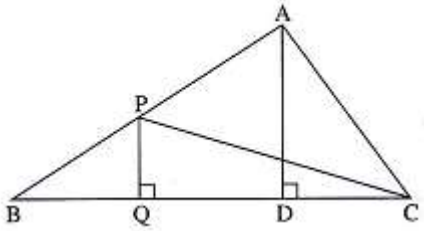
**15)** In adjoining figure PQ ⊥ BC, AD ⊥ BC, then find following ratios. **2**

(1) $\frac{A(\Delta PQB)}{A(\Delta PBC)}$

(2) $\frac{A(\Delta PBC)}{A(\Delta ABC)}$

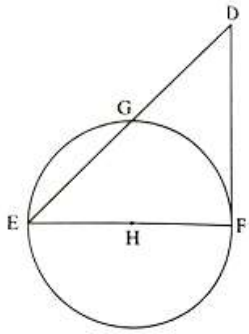
(3) $\frac{A(\Delta ABC)}{A(\Delta ADC)}$

(4) $\frac{A(\Delta ADC)}{A(\Delta PQC)}$



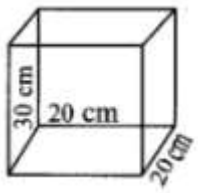

**16)** In figure, seg EF is a diameter and seg DF is a tangent segment. The radius of the circle is r. Prove that **2**

DE x GE = $4\ r^2$



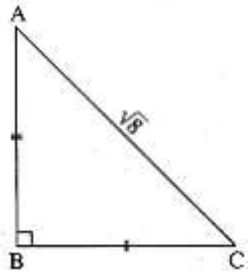

**17)** Measure of an arc of a circle is 80° and its radius is 18 cm. Find the length of the arc. ( $\pi = 3.14$ ) **2**

**18)** The length, breadth and height of an oil can are 20 cm, 20 cm and 30 cm respectively as shown in the adjacent figure. How much oil will it contain? (1 litre = 1000 $cm^3$) **2**

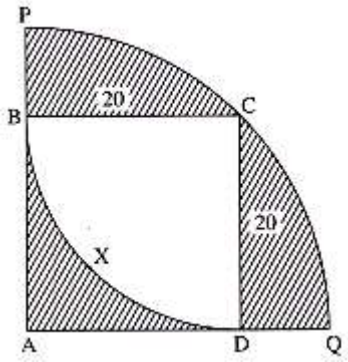


**Answer the following (any Five) :** **5 × 3=15**

**19)** For finding AB and BC with the help of information given in figure, complete following activity, **3**

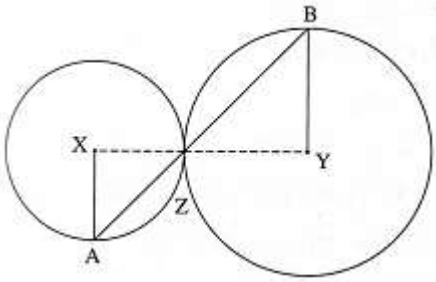



**20)** In the figure, square ABCD is inscribed in the sector A - PCQ. The radius of sectorC-BXD is 20 cm. Complete the following activity to find the area of shaded region. **3**




**21)** In the adjoining figure, circles with centres X and Y touch each other at point Z. A secant passing through Z intersects the circles at points A and B respectively. prove that. radius XA || radius YB. **3**

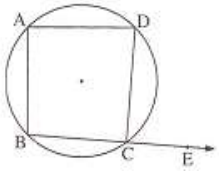
Construction : Draw segments XZ and YZ.




**22)** Prove the following: **3**

$$\frac{\tan^3\theta - 1}{\tan\theta - 1} = \sec^2\theta + \tan\theta$$

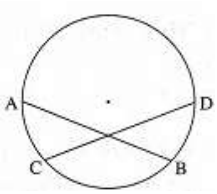
**23)** Statement: An exterior angle of a cyclic quadrilateral is congruent to the angle opposite to its adjacent interior angle. **3**




Given : $\square ABCD$ is cyclic. $\angle DCE$ is an exterior angle of $\square ABCD$

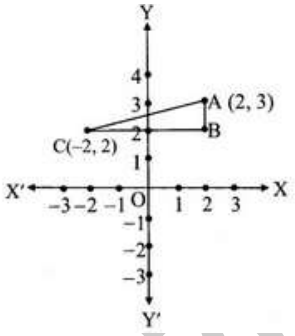
To prove : $\angle DCE \cong \angle BAD$

**24)** In figure, $\text{chord } AB \cong \text{chord } CD$ prove that $\text{arc } AC \cong \text{arc } BD$ **3**




**25)** A side of an isosceles right angled triangle is x. Find its hypotenuse. **3**

**26)** In the figure, seg AB || Y-axis and seg CB || X-axis. Co-ordinates of points A and C are given. To find AC, fill in the boxes given below. **3**




**Answer the following (any One) :** **1 × 5=5**

**27)** Walls of two buildings on either side of a street are parallel to each other. A ladder 5.8 m long is placed on the street such that its top just reaches the window of a building at the height of 4 m. On turning the ladder over to the other side of the street, its top touches the window of the other building at a height 4.2 m. Find the width of the street. **5**

**28)** Verify that points P(-2, 2), Q (2, 2) and R (2, 7) are vertices of a right angled triangle. **5**