



# SUCCESS KEY TEST SERIES

X (English)

(Worksheet-2 Math-2 (Ch-5,6))

Mathematics Part - II-

DATE:

TIME: 1 Hour

MARKS: 20

SEAT NO:

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## Q.1 A Multiple Choice Questions

2

1 Distance of point (-3,4) from the origin is .....

- a. 7      b. 1      c. 5      d. - 5

2  $\tan 45 = ?$

- a.  $\frac{1}{\sqrt{2}}$       b. 1      c.  $\sqrt{2}$       d. 2

## B Answer the following.

3

1 Prove the following

$$\tan^4 \theta + \tan^2 \theta = \sec^4 \theta - \sec^2 \theta$$

2 Find the distances between the following points.

P (-6, -3), Q (-1, 9)

3 Prove the following

$$\cos^2 \theta (1 + \tan^2 \theta) = 1$$

## Q.2 A Attempt the following (Any Two)

4

1 Prove the following :

$$\sec \theta + \tan \theta = \frac{\cos \theta}{1 - \sin \theta}$$

LHS :  $\sec \theta + \tan \theta$

$$= \frac{1}{\cos \theta} + \frac{\sin \theta}{\cos \theta} \quad \dots \left[ \sec \theta = \frac{1}{\cos \theta}, \tan \theta = \frac{\sin \theta}{\cos \theta} \right]$$

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

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

$$= \frac{1 - \sin^2 \theta}{\cos \theta (1 - \sin \theta)} \quad \dots [\text{using } (a+b)(a-b) = \text{_____}]$$

$$= \frac{\cos^2 \theta}{\cos \theta (1 - \sin \theta)} \quad \dots [ \text{_____} = 1 ]$$

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

$$\therefore \text{LHS} = \text{_____}$$

2 Find the slope of the diagonals of a quadrilateral with vertices A(1, 7), B(6, 3), C(0, -3) and D(-3, 3).

$$\text{Slope of diagonal AC} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{-3 - 7}{0 - 1}$$

$$= \frac{-10}{-1}$$

$$= 10$$

$$\text{Slope of diagonal BD} = \frac{y_4 - y_2}{x_4 - x_2}$$

$$= \frac{3 - 3}{-3 - 6}$$

$$= 0$$

$$= \frac{0}{-9}$$

$$= \underline{\hspace{2cm}}$$

Ans. Slope of diagonal AC is \_\_\_\_\_ and slope of diagonal BD is \_\_\_\_\_

3 Prove that :  $(\sec\theta - \cos\theta)(\cot\theta + \tan\theta) = \tan\theta \sec\theta$ .

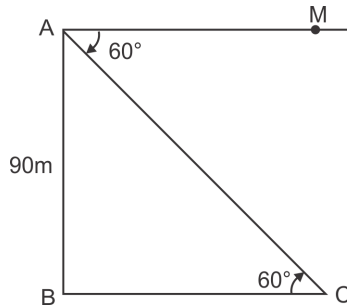
$$\begin{aligned} \text{LHS} &= (\sec\theta - \cos\theta)(\cot\theta + \tan\theta) \\ &= \left(\frac{1}{\cos\theta} - \cos\theta\right) \underline{\hspace{2cm}} \quad \left[\sec\theta = \frac{1}{\cos\theta}, \cot\theta = \frac{1}{\tan\theta}\right] \\ &= \underline{\hspace{2cm}} \left(\frac{1 + \tan^2\theta}{\tan\theta}\right) \\ &= \left(\frac{\sin^2\theta}{\cos\theta}\right) \left(\frac{\sec^2\theta}{\tan\theta}\right) \quad \dots [\sin^2\theta + \cos^2\theta = 1, 1 + \tan^2\theta = \sec^2\theta] \\ &= \frac{\sin^2\theta}{\cos\theta} \times \underline{\hspace{2cm}} \quad \dots \left[\tan\theta = \frac{\sin\theta}{\cos\theta}\right] \\ &= \frac{\sin^2\theta}{\cos\theta} \times \frac{1}{\cos\theta \times \sin\theta} \\ &= \underline{\hspace{2cm}} \times \frac{1}{\cos\theta} \\ &= \tan\theta \times \underline{\hspace{2cm}} \\ \therefore \underline{\hspace{2cm}} &= \text{RHS} \end{aligned}$$

**B Attempt the following.(Any One)**

1 Find the value of y if the distance between points A (2, - 2) and B (- 1, y) is 5.

$$\begin{aligned} AB^2 &= [(- 1) - 2]^2 + [y - (- 2)]^2 \dots \underline{\hspace{2cm}} \\ \therefore 5^2 &= (- 3)^2 + \underline{\hspace{2cm}}^2 \\ \therefore 25 &= \underline{\hspace{2cm}} \\ \therefore 16 &= (y + 2)^2 \\ \therefore y + 2 &= \underline{\hspace{2cm}} \\ \therefore y + 2 &= \pm 4 \\ \therefore y &= 4 - 2 \text{ or } y = - 4 - 2 \\ \therefore y &= \underline{\hspace{2cm}} \text{ or } y = \underline{\hspace{2cm}} \\ \therefore \text{value of } y &\text{ is } \underline{\hspace{2cm}}. \end{aligned}$$

2 From the top of a lighthouse, an observer looking at a ship makes an angle of depression of  $60^\circ$ . If the height of the lighthouse is 90 m then find how far is the ship from the lighthouse. ( $\sqrt{3} = 1.73$ )



Let AB be the light house.  
 The ship is at C and observer is at A.  
 $\angle MAC$  is the angle of depression.  
 $\angle MAC = \angle ACB = \underline{\hspace{2cm}}$  ..... Alternate angle  
 $AB = \underline{\hspace{2cm}}$ .  
 From the figure,  $\tan 60^\circ = \underline{\hspace{2cm}}$   
 $\sqrt{3} = \frac{90}{BC}$   
 $BC = \frac{90}{\sqrt{3}} = \underline{\hspace{2cm}} = \frac{90\sqrt{3}}{3} = \underline{\hspace{2cm}}$   
 $\therefore BC = 30 \times 1.73$   
 $\therefore$  The ship is at a distance of \_\_\_\_\_ from the light house.

**Q.3 Answer the following (Any Two)****4**

- 1 If  $\sec \theta = \frac{37}{35}$ , find the value of  $\tan \theta$ , ( $\theta$  is an acute angle)
- 2 Find  $k$ , if  $B(k, -5)$ ,  $C(1, 2)$  and slope of the line is 7.
- 3 Prove that :  $\frac{1}{\sec \theta - \tan \theta} = \sec \theta + \tan \theta$

**Q.4 Answer the following(Any One)****4**

- 1 Prove the following.

$$\frac{1}{\sin A + \cos A + 1} + \frac{1}{\sin A + \cos A - 1} = \sec A + \operatorname{cosec} A$$

- 2 In the following examples, can the segment joining the given points form a triangle? If triangle is formed, state the type of the triangle considering sides of the triangle.

$$A(\sqrt{2}, \sqrt{2}), B(-\sqrt{2}, -\sqrt{2}), C(-\sqrt{6}, \sqrt{6})$$