SUCCESS KEY TEST SERIES

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

Mathematics Part - II-

DATE:	
TIME: 1 Hour	
MARKS: 20	

SEAT NO:

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

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

= ______

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

$= \frac{1-\sin^2\theta}{\cos\theta\,(1-\sin\theta)}$ ...[using (a+b) (a-b) = ______]

$= \frac{\cos^2\theta}{\cos\theta\,(1-\sin\theta)}$ ...[______ = 1]

= ______

∴ LHS = ______

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).

Slope of diagonal AC = ______

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

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

= ______

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

= ______

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

= _____

Ans. Slope of diagonal AC is _____ and slope of diagonal BD is _____

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

LHS = $(\sec\theta - \cos\theta)(\cot\theta + \tan\theta)$

$= \left(\dfrac{1}{\cos\theta} - \cos\theta\right)$ _____ $\left[\sec\theta = \dfrac{1}{\cos\theta},\ \cot\theta = \dfrac{1}{\tan\theta}\right]$

= _____ $\left(\dfrac{1 + \tan^2\theta}{\tan\theta}\right)$

$= \left(\dfrac{\sin^2\theta}{\cos\theta}\right)\left(\dfrac{\sec^2\theta}{\tan\theta}\right)$ ... $[\sin^2\theta + \cos^2\theta = 1,\ 1+\tan^2\theta = \sec^2\theta]$

$= \dfrac{\sin^2\theta}{\cos\theta} \times$ _____ ... $\left[\tan\theta = \dfrac{\sin\theta}{\cos\theta}\right]$

$= \dfrac{\sin^2\theta}{\cos\theta} \times \dfrac{1}{\cos\theta \times \sin\theta}$

= _____ $\times \dfrac{1}{\cos\theta}$

= $\tan\theta \times$ _____

$\therefore$ _____ = RHS

B Attempt the following.(Any One) **3**

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

$AB^2 = [(-1) - 2]^2 + [y - (-2)]^2$ ... _____

$\therefore$ $5^2 = (-3)^2 +$ _____^{2}

$\therefore$ 25 = _____

$\therefore$ $16 = (y + 2)^2$

$\therefore$ y + 2 = _____

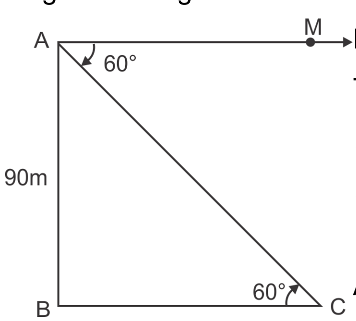
$\therefore$ $y + 2 = \pm 4$

$\therefore$ y = 4 - 2 or y = - 4 - 2

$\therefore$ y = _____ or y = _____

$\therefore$ value of y is _____.

2 From the top of a lighthouse, an observer looking at a ship makes an angle of depression of 60^0. 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.

$\angle MAC = \angle ACB$ = _____ ..... Alternate angle

AB = _____.

From the figure, $\tan 60^o$ = _____

$\sqrt{3} = \dfrac{90}{BC}$

$BC = \dfrac{90}{\sqrt{3}}$ = _____ $= \dfrac{90\sqrt{3}}{3}$ = _____

$\therefore$ $BC = 30 \times 1.73$

$\therefore$ 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 $\tan\theta$, (θ 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 + 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 $(-\sqrt{6}, \sqrt{6})$