SUCCESS KEY TEST SERIES

X- Semi English

(Unit Test- 3 Math-2 (Ch- 5, 6))

Mathematics Part - II-

DATE:

TIME: 1 hrs

MARKS: 20

SEAT NO:

Q.1 A) Choose the correct alternative. **(2)**

1) Find the slope of the lines whose inclinations are - 30°

a. $\frac{1}{\sqrt{3}}$ b. 1 c. not defined d. $\sqrt{3}$

2) If θ is an acute angle of a right tringle, then the value of
$\sin\theta \cos(90^0 - \theta) + \cos\theta \sin(90^0 - \theta)$ is

a. 0 b. $2\sin\theta\cos\theta$ 3. 1 4. $2\sin^2\theta$

B) Solve the following questions. (Any one) **(2)**

1) Angles made by the line with the positive direction of X-axis are given. Find the slope of these lines.
90º

2) If $\sin\theta = \frac{15}{17}$, find the value of $\cos\theta$, (θ is an acute angle)

Q.2 A) Complete the following Activities. (Any two) **(4)**

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

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

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

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

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

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

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

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

$= \tan\theta \times$ _____

$\therefore$ _____ = RHS

2) Find the coordinates of the midpoint of the line segment joining P(0,6) and Q(12,20).

Let, P ≡ (0, 6) ≡ (x_1, y_1),

Q ≡ (12, 20) ≡ _____

Let, R ≡ (x, y) is the midpoint of seg PQ

$\therefore$ By midpoint formula

$x = \frac{x_1 + x_2}{2}$, y =_____

$= \frac{0+12}{2}$, $= \frac{6+20}{2}$

= _____ , = _____

∴ x = _____ , y = _____

∴ R ≡ _____

∴ The coordinates of midpoint of seg PQ are _____

3) Angles made by the line with the positive direction of X-axis are given. Find the slope of these lines.
45º

Here $\theta = 45^\circ$

∴ slope of the line = _____

= tan _____º

= _____

B) Solve the following questions. (Any one) **(2)**

1) A (h, -6), B (2, 3) and C (-6, k) are the co-ordinates of vertices of a triangle whose centroid is G (1, 5). Find h and k.

2) Find the centroids of the triangles whose vertices are given below.
(3, − 5), (4, 3), (11, − 4)

Q.3 Solve the following questions. (Any one) **(3)**

1) If $\tan\theta = \frac{3}{4}$, than find the values of $\sec\theta$ and $\cos\theta$.

2) A storm broke a tree and the treetop rested on ground 20 m away from the base of the tree, making an angle of 60° with the ground. Find the height of the tree.

3) Find the point on the X-axis which is equidistant from A (– 3, 4) and B (1, – 4).

Q.4 Solve the following questions. (Any one) **(4)**

1) Determine whether the points are collinear.
A (1, – 3), B (2, – 5), C (– 4, 7)

2) Find the equation of the line passing through the point of intersection of the line 4x + 3y + 2 = 0 and 6x + 5y + 6 = 0 and the point of intersection of the lines 4x - 3y - 17 = 0 and 2x + 3y + 5 = 0.

Q.5 Solve the following questions. (Any one) **(3)**

1) Find the coordinates of point P if P divides the line segment joining the points.
A (-1,7) and B (4,- 3) in the ratio 2 : 3.

2) Show that A (-4, -7), B (- 1, 2), C (8, 5) and D (5, - 4) are the vertices of a rhombus ABCD.