

**SHRI DHARMASTHALA MANJUNATHESHWARA SCHOOL,
GRADE 9 WORKSHEET 3: ANSWER KEY**

1. If ABCD is a square with A(3,4), B(-2,4), C(-2,-1), find D.

- Square: $AB \parallel CD$, $BC \parallel AD$.
- Coordinates: A(3,4), B(-2,4), C(-2,-1).
- Since AB is horizontal, BC is vertical.
- So, D has coordinates (3,-1).

Answer: $D(3, -1)$.

2. Plot (0,-4), (-4,0), (0,0). Find the type of figure and its area.

- Points: O(0,0), P(0,-4), Q(-4,0).
- This is a **right triangle** (right angle at O).
- Base = 4 units, Height = 4 units.
- Area = $\frac{1}{2} \times 4 \times 4 = 8$ sq. units.

Answer: Right-angled triangle, Area = 8.

3. Plot A(-4,4), B(-6,0), C(-4,-4), D(-2,0). What figure? Find area.

- By plotting, ABCD forms a **rhombus** (all sides equal).
- Area of rhombus = $\frac{1}{2} \times d_1 \times d_2$.
- Diagonal AC = distance between A(-4,4) and C(-4,-4) = 8.
- Diagonal BD = distance between B(-6,0) and D(-2,0) = 4.
- Area = $\frac{1}{2} \times 8 \times 4 = 16$.

Answer: Rhombus, Area = 16.

4. Check if (3,5), (1,-1), (0,1) are collinear.

- Area of triangle = $\frac{1}{2} [x_1(y_2 - y_3) + x_2(y_3 - y_1) + x_3(y_1 - y_2)]$.
- = $\frac{1}{2} [3((-1) - 1) + 1(1 - 5) + 0(5 - (-1))]$.
- = $\frac{1}{2} [3(-2) + 1(-4) + 0(6)]$.
- = $\frac{1}{2} [-6 - 4 + 0] = -5$.
- $\neq 0 \rightarrow$ not collinear.

Answer: Not collinear.

5. Area of triangle with (0,5), (5,0), (0,0).

- Right triangle at (0,0).
- Base = 5, Height = 5.
- Area = $\frac{1}{2} \times 5 \times 5 = 12.5$.

Answer: 12.5 sq. units.

6. Square with A(5,3), B(-2,3), D(5,-4). Find C and area.

- AB horizontal, AD vertical.
- So, C(-2,-4).
- Side length = AB = distance between A(5,3) and B(-2,3) = 7.
- Area = $7^2 = 49$.

Answer: C(-2, -4), Area = 49.

7. Equilateral triangle with B(3,0), C(-3,0). Find A.

- BC = distance = 6.
- Height = $\sqrt{3}/2 \times 6 = 3\sqrt{3}$.
- Midpoint of BC = (0,0).
- Vertex A lies above/below y-axis at $(0, \pm 3\sqrt{3})$.

Answer: $A(0, 3\sqrt{3})$ or $A(0, -3\sqrt{3})$.

8. Rectangle with length 5, breadth 3, one vertex at origin.

- Place O(0,0). Length = 5 on X-axis, breadth = 3 on Y-axis.
- Vertices: O(0,0), A(5,0), B(5,3), C(0,3).
- Since one vertex lies in third quadrant, another set possible: O(0,0), A(-5,0), B(-5,-3), C(0,-3).

Answer: Possible coordinates: (0, 0), (5, 0), (5, 3), (0, 3) or (0, 0), (-5, 0), (-5, -3), (0, -3).

9. Find coordinates:

- i) Lies on both x and y-axis $\rightarrow (0,0)$.
- ii) Abscissa = 5, lies on x-axis $\rightarrow (5,0)$.
- iii) Ordinate = -4, lies on y-axis $\rightarrow (0,-4)$.

Answer: (i) (0,0), (ii) (5,0), (iii) (0,-4).

10. Quadrilateral with (-4,4), (-6,0), (-4,-4), (-2,0).

- Same as Q3: rhombus.
- Area = 16 sq units.

Answer: Rhombus, Area = 16.