

CCT Weekly Practice (Mathematics)

GEOMETRY AROUND US

Since birth, humans are attracted to diverse shapes, designs, and colours. This is also reinforced by the fact that while buying things in the market, we are allured by fabrics with fascinating patterns, books with eye-catching covers, trinkets with captivating patterns, tea mugs with beautiful forms, and many other such things. Geometry can be referred to as being “omnipresent.”

Kuhu was amazed to see that the mat in her drawing room (shown in figure 1) consists of beautiful geometric pattern consisting of triangles and squares. Each square has two intersecting diagonals and the triangle so obtained has lines parallel to diagonal lines which further meet at a vertex forming a small triangle in each one-fourth part of square.

She liked the design very much and made one such square using different colour combinations on a cartesian plane as shown in figure 2 for her Mathematics Art Integrated project.



Figure 1

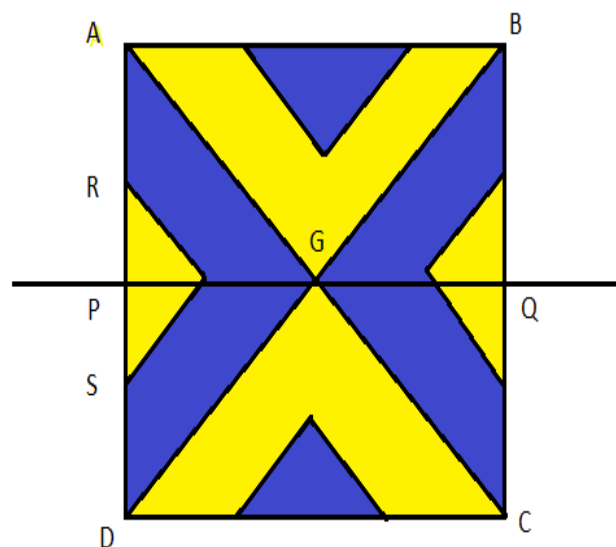


Figure 2

Question 1: If P is the mid-point of A (-3, 8) and D (-3, -8) then, find the coordinates of P.

Question 2: The distance of B (3, 8) from the origin is

- a) $\sqrt{24}$ units
- b) $\sqrt{72}$ units
- c) $\sqrt{73}$ units
- d) $\sqrt{36}$ units

Question 3: Find the coordinates of a point which divides A (-3, 8) and B (3, 8) in the ratio 1:2.

- a) (-4, 4)
- b) (0, 0)
- c) (3, 4)
- d) (-1, 8)

Question 4: What is the distance between the points of A (-3, 8) and B (3, 8)?

- a) 6 units
- b) 3 units
- c) 9 units
- d) 8 units

Question 5: Find the coordinates of G, using the property of diagonals of a square, given that the coordinates of B and D are (3, 8) and (-3, -8)

- a) (6, 8)
- b) (0, 0)
- c) (3, 4)
- d) (0, 10)

Created by:-

Ms. Abha Dua, Lotus Valley International School, Sec 126, Expressway, Noida.

CCT Weekly Practice (Mathematics)

GEOMETRY AROUND US

Answers:-

1. Coordinates of mid-point are $x = \frac{x_1 + x_2}{2}, y = \frac{y_1 + y_2}{2}$

$$x = \frac{-3 + (-3)}{2}, y = \frac{8 + (-8)}{2} \Rightarrow x = -3, y = 0$$

2. (c) Distance = $\sqrt{x^2 + y^2}$

$$\sqrt{3^2 + 8^2} = \sqrt{9 + 64} = \sqrt{73} \text{ units}$$

3. (d) The coordinates of a point are $x = \frac{m_1x_2 + m_2x_1}{m_1 + m_2}, y = \frac{m_1y_2 + m_2y_1}{m_1 + m_2}$

$$x = \frac{1 \times 3 + 2 \times (-3)}{1 + 2}, y = \frac{1 \times 8 + 2 \times 8}{1 + 2}; \Rightarrow x = -1, y = 8;$$

The coordinates are (-1, 8)

4. (a) Distance AB = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
 $= \sqrt{\{3 - (-3)\}^2 + (8 - 8)^2} = 6 \text{ units}$

5. (b) Diagonals of a square bisect each other at right angle.

G is the midpoint of BD

$$\text{Coordinates of mid-point are } x = \frac{x_1 + x_2}{2}, y = \frac{y_1 + y_2}{2}$$

$$= x = \frac{3 + (-3)}{2}, y = \frac{8 + (-8)}{2} \Rightarrow x = 0, y = 0$$

Coordinates of G are (0, 0)

Created by:-

Ms. Abha Dua, Lotus Valley International School, Sec. 126, Express way, Noida.