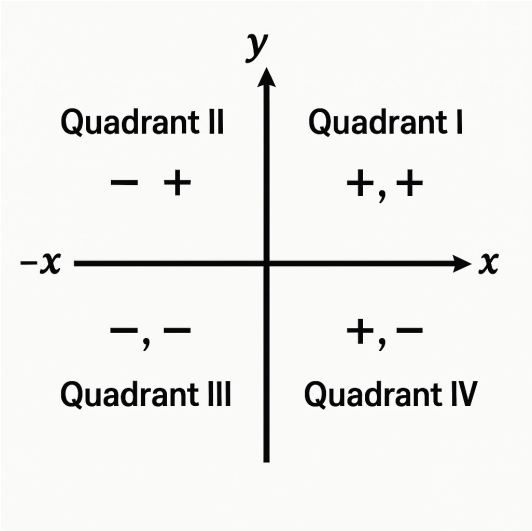
The Rectangular Coordinate System

The rectangular coordinate system is formed by two number lines: the x-axis (horizontal) and the y-axis (vertical). These axes intersect at a point called the origin, where both x and y equal zero: (0, 0). Quadrants of the Coordinate Plane

The axes divide the plane into four quadrants:

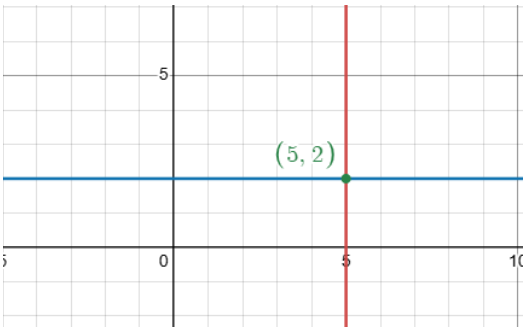


- Quadrant I: (+x, +y)
- Quadrant II: (−x, +y)
- Quadrant III: (−x, −y)
- Quadrant IV: (+x, −y)

Ordered Pairs and Coordinates

Any point in the plane is represented by an ordered pair: (x, y). The x-coordinate (abscissa) is the position relative to the y-axis, and the y-coordinate (ordinate) is the position relative to the x-axis.

To plot a point like (5, 2):
1. Locate 5 on the x-axis and draw a vertical line.
2. Locate 2 on the y-axis and draw a horizontal line.
3. The point is where the lines intersect.



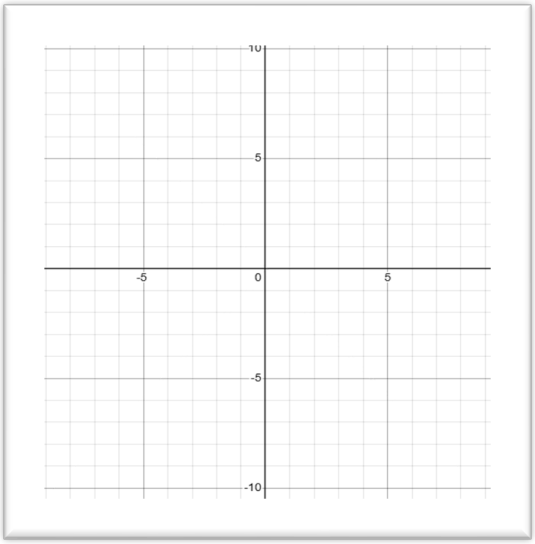
Special Cases

- Origin: (0, 0)
- Point on x-axis: (0, y)
- Point on y-axis: (x, 0)

Exercises

1. Graph the following ordered pairs:

1. A (3, 2)
2. B (−4, 1)
3. C (−5, −1)
4. D (2, −4)
5. E (0, −1)
6. F (3, 0)
7. G (0, 0)



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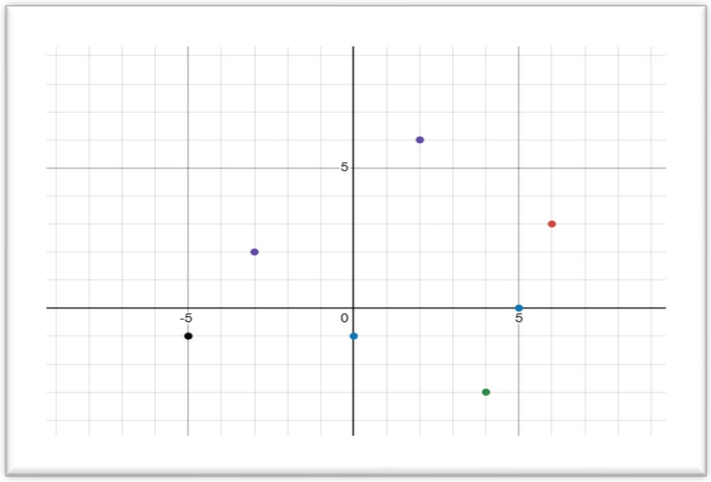
2. Give the coordinates of the following points:



8. A (,)
9. B (,)
10. C (,)
11. D (,)
12. E (,)
13. F (,)
14. G (,)

3. Plot the following points:

15. A (5, −1)
16. B (−2, −2)
17. C (0, −1)
18. D (3, 4)
19. E (3, −5)
20. F (2, 0)
21. G (−5, −1)