

MAT 1275, Classwork16, Fall2024

ID: _____ Name: _____

1. Just like maps use latitude (north or south) and longitude (east or west) to identify a location, a rectangular

Coordinate system is used to represent ordered pairs of numbers.

The horizontal number line is called x-axis.

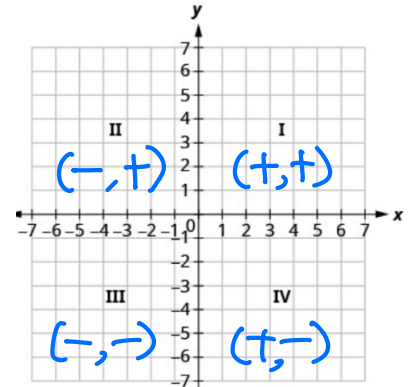
The vertical number line is called y-axis.

This coordinate plane is also called x-y plane.

Two perpendicular axes divide the plane into four quadrants:

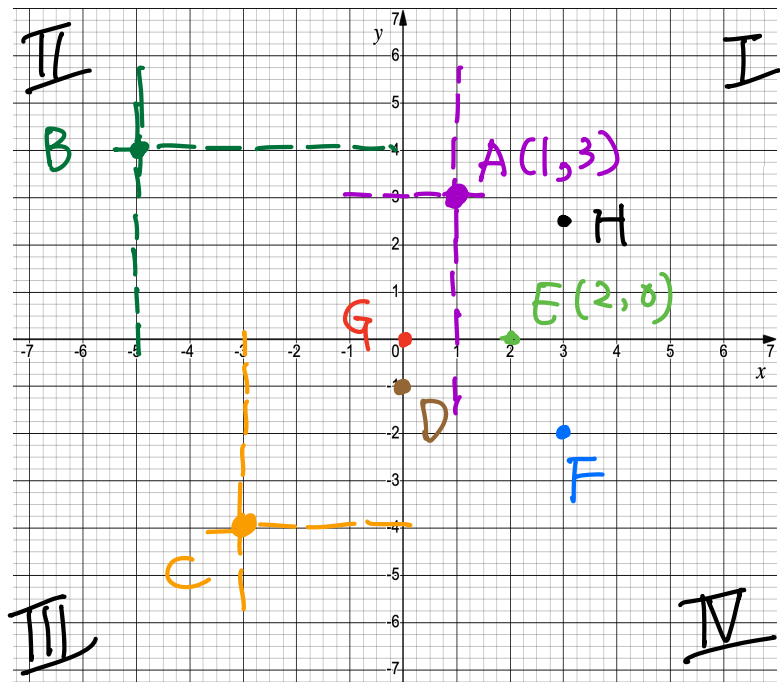
Quadrant I: the first quadrant with $x > 0, y > 0$. Quadrant II: the second quadrant with $x < 0, y > 0$.

Quadrant III: the third quadrant with $x < 0, y < 0$. Quadrant IV: the fourth quadrant with $x > 0, y < 0$.



2. Plot each point in the rectangular coordinate system:

- A. (1,3)
- B. (-5,4)
- C. (-3,-4)
- D. (0,-1)
- E. (2,0)
- F. (3,-2)
- G. (0,0)
- H. $(3, \frac{5}{2})$



3. The intercept point of x-axis and y-axis is called origin and its coordinate is $(0, 0)$.

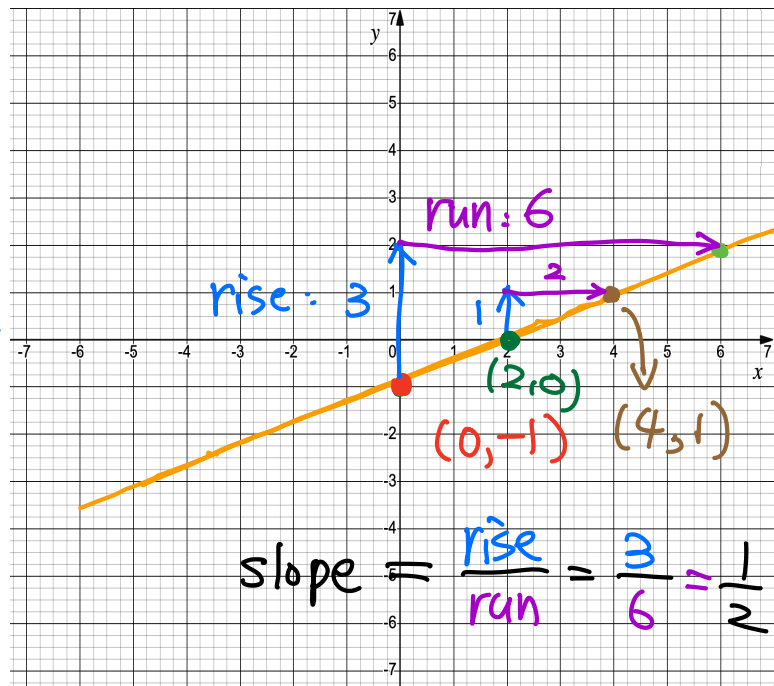
4. Graph the equation $2y - x = -2$ by plotting points.

| x | y | (x, y) |
|----|----|---------|
| 2 | 0 | (2, 0) |
| 0 | -1 | (0, -1) |
| 4 | 1 | (4, 1) |
| 6 | 2 | (6, 2) |
| 8 | 3 | (8, 3) |
| 10 | 4 | (10, 4) |
| 12 | 5 | (12, 5) |

$$2y = -2, y = -1$$

$$2 - x = -2, \Rightarrow x = 4$$

$$4 - x = -2 \Rightarrow x = 6$$



5. The point with **zero value of y** is called X-intercept of the graph. just like (2,0)

6. The point with **zero value of x** is called y-intercept of the graph. just like (0, -1)

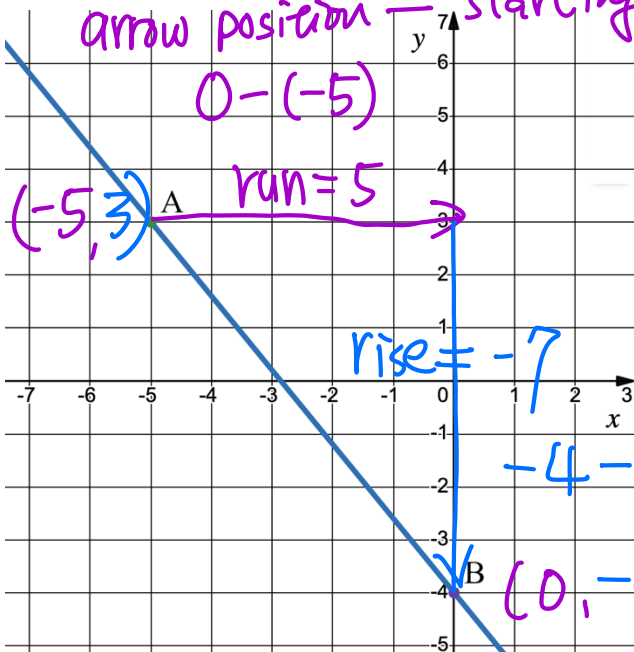
7. Rewrite $2y - x = -2$ into the form $y = \frac{1}{2}x - 1$.

$$2y = x - 2 \quad \begin{array}{l} \text{+x} \quad \text{+x} \\ \text{divided} \\ \text{by 2} \end{array} \Rightarrow y = \frac{x-2}{2} = \frac{x}{2} - \frac{2}{2} = \frac{1}{2}x - 1$$

8. The number $\frac{1}{2}$ in the form $y = \frac{1}{2}x - 1$ is called the slope of the line.

9. The slope = $\frac{\text{rise}}{\text{run}}$. For $y = \frac{1}{2}x - 1$, run = 6 and rise = 3.

10. arrow position — starting position



Point A(-5, 3)

Point B(0, -4)

$$\text{slope} = \frac{-7}{5} = \frac{-4 - (3)}{0 - (-5)}$$

y-intercept (0, 4)

Equation: $(y = (\text{slope}) \cdot x + (\text{a constant}))$

$$y = -\frac{7}{5}x + \text{?} = -4$$

Find slope by point A and B:

$$y = -\frac{7}{5}x - 4$$

$$\text{If } x = -5, y = 3$$

$$3 = -\frac{7}{5} \cdot (-5) + ?$$

$$3 = 7 + ?$$

$$\Rightarrow -4 = ?$$

3. Find the equation of a line that passes through the points $A(-3, 2)$ and $B(1, 6)$.

$$\text{Slope} = \frac{6 - 2}{1 - (-3)} = \frac{4}{1 + 3} = \frac{4}{4} = 1$$

Equation

$$y = 1 \cdot x + ?$$

$$y = x + 5$$

By "A(-3, 2)"

$$2 = 1 \cdot (-3) + ?$$

$$\Rightarrow ? = 2 + 3 = 5$$