6^2 + 8^2 = c^2
36 + 64 = c^2
100 = c^2
10 = c

(3, 5) to (9, 13)

a = 9 - 3 = 6
or count 6 grids

b = 13 - 5 = 8
or count 8 grids
Graphing or Cartesian Coordinate:

- Any point on the graph can be represented as an ordered pair (x-coordinate, y-coordinate).

- The x-axis and y-axis divides the plane into four quadrants:
  - Quadrant I: (+, +)
  - Quadrant II: (-, +)
  - Quadrant III: (-, -)
  - Quadrant IV: (+, -)

  **Examples:**
  - (-2, 1) is in quadrant II
  - (a, 5) is in quadrant I or II or on y-axis
  - (4, 0) is NOT in any quadrant

- All points on the x-axis have a y-coordinate of zero.
- All points on the y-axis have an x-coordinate of zero.

Pythagorean Theorem:

\[ a^2 + b^2 = c^2 \]

\( c \) is the hypotenuse, which is the longest side and is also the side opposite of the \( 90^\circ \) angle.

Distance between any two arbitrary points on the plane \((x_1, y_1)\) and \((x_2, y_2)\) is \(d\):

\[ d = \sqrt{(x_2-x_1)^2 + (y_2-y_1)^2} \]

**Example:** What's the distance between \((3, 5)\) and \((4, 13)\)?

\[ d = \sqrt{(4-3)^2 + (13-5)^2} = \sqrt{1^2 + 8^2} = \sqrt{1 + 64} = \sqrt{65} = 8.06 \]
(1) What's the distance between \((2, -2)\) and \((4, 0)\)?

\[
\begin{align*}
\text{Distance} & = \sqrt{(4 - 2)^2 + (0 - (-2))^2} \\
& = \sqrt{2^2 + 2^2} \\
& = \sqrt{4 + 4} \\
& = \sqrt{8} \\
& = 2\sqrt{2}
\end{align*}
\]

(2) Round the distance to two decimal places, between \((2, 4)\) and \((5, 3)\).

\[
\begin{align*}
\text{Distance} & = \sqrt{(5 - 2)^2 + (3 - 4)^2} \\
& = \sqrt{3^2 + 1^2} \\
& = \sqrt{9 + 1} \\
& = \sqrt{10} \\
& \approx 3.16
\end{align*}
\]