Section 3.3 Intercepts

# Objective 1: Identifying Intercepts

Points where a graph crosses the $y$-axis are called $y$-intercepts. Points where a graph crosses the $x$-axis are called $x$-intercepts. For example, the graph of $y=4x-8$ crosses the $y$-axis at the point $(0,-8)$. This point is the $y$-intercept of the graph. The graph of $y=4x-8$ crosses the $x$-axis at the point $(2,0)$. This point is the $x$-intercept of the graph.



Identify the $x$- and $y$-intercepts.

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| a. Graph of the line y = x + 4. | b. v-shaped graph with points shown on the x-axis at -6 and 6 and a point shown on the y-axis at -7. |

# Objective 2: Using Intercepts to Graph a Linear Equation

Given a linear equation, one way to graph the line is by finding its intercepts. To find the $x$-intercept, let $y=0$ and solve for $x$. To find the $y$-intercept, let $x=0$ and solve for $y$.

Graph the equation by using the $x$- and $y$-intercepts.

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| a. $5x-4y=20$$x$-intercept:$y$- intercept:Blank coordinate plane that spans from negative ten to positive ten on each axis with a scale of one unit. | b. $2y=-3x+15$$x$-intercept:$y$- intercept:Blank coordinate plane that spans from negative ten to positive ten on each axis with a scale of one unit. |

In some cases, finding the intercept or intercepts of a line does not provide enough information to graph it.

Graph the equation. State the $x$- and $y$-intercepts.

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| --- | --- |
| c. $y=\frac{4}{5}x$$x$-intercept:$y$- intercept:Blank coordinate plane that spans from negative ten to positive ten on each axis with a scale of one unit. |  |

# Objective 3: Graphing Vertical and Horizontal Lines

In the previous section, we saw that some linear equations graph vertical or horizontal lines. It is useful to be able to tell by looking at a linear equation if the resulting graph will be a vertical or horizontal line.

**Vertical Lines:**

The graph of $x=c$, where $c$ is a real number, is a vertical line with $x$-intercept $(c,0)$.

**Horizontal Lines:**

The graph of $y=c$, where $c$ is a real number, is a horizontal line with $y$-intercept $(0,c)$.

Graph the equation. State the $x$- and $y$-intercepts.

|  |  |
| --- | --- |
| a. x$=-5$$x$-intercept:$y$- intercept:Blank coordinate plane that spans from negative ten to positive ten on each axis with a scale of one unit. | b. $y-8=0$$x$-intercept:$y$- intercept:Blank coordinate plane that spans from negative ten to positive ten on each axis with a scale of one unit. |