

Reteach

Graph a Line Using Intercepts P. 2

Standard form is when an equation is written in the form $Ax + By = C$.

Example

State the x- and y-intercepts of $3x + 2y = 6$. Then graph the function.

Step 1 Find the x-intercept.

To find the x-intercept, let $y = 0$.

$$\begin{aligned} 3x + 2y &= 6 \\ 3x + 2(0) &= 6 \\ 3x + 0 &= 6 \\ 3x &= 6 \\ x &= 2 \end{aligned}$$

Write the equation.
Replace y with 0.
Multiply.
Simplify.
Divide each side by 3.

The x-intercept is 2.

Step 2 Find the y-intercept.

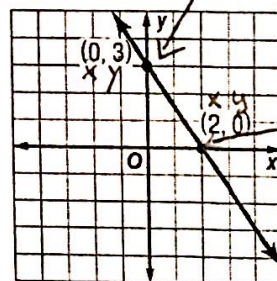
To find the y-intercept, let $x = 0$.

$$\begin{aligned} 3x + 2y &= 6 \\ 3(0) + 2y &= 6 \\ 0 + 2y &= 6 \\ 2y &= 6 \\ y &= 3 \end{aligned}$$

Write the equation.
Replace x with 0.
Multiply.
Simplify.
Divide each side by 2.

The y-intercept is 3.

when $x=0$
 $y=3$ y-intercept



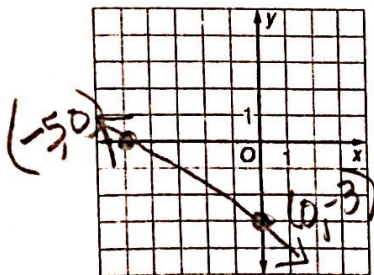
x-intercept
when $y=0$
 $x=2$

Step 3 Graph the points (2, 0) and (0, 3) on a coordinate plane. Then connect the points.

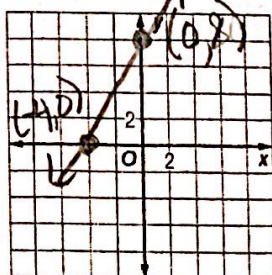
Exercises

State the x- and y-intercepts of each function. Then graph the function.

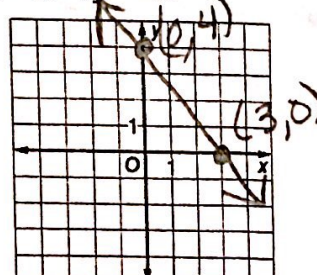
1. $3x + 5y = -15$



2. $-2x + y = 8$



3. $-4x - 3y = -12$



x-int let $y=0$

$$\begin{aligned} 3x + 5y &= -15 \\ 3x + 5(0) &= -15 \\ 3x + 0 &= -15 \\ 3x &= -15 \\ x &= -5 \end{aligned}$$

Equations in Two Variables
(-5, 0)

y-int let $x=0$

$$\begin{aligned} 3x + 5y &= -15 \\ 3(0) + 5y &= -15 \\ 0 + 5y &= -15 \\ 5y &= -15 \\ y &= -3 \end{aligned}$$

(0, -3)

x-int

$$\begin{aligned} -2x + y &= 8 \\ -2x + (0) &= 8 \\ -2x &= 8 \\ x &= -4 \end{aligned}$$

(-4, 0)

y-int

$$\begin{aligned} -2x + y &= 8 \\ -2(0) + y &= 8 \\ y &= 8 \end{aligned}$$

(0, 8)

2

x-int

$$\begin{aligned} -4x - 3y &= -12 \\ -4x - 3(0) &= -12 \\ -4x &= -12 \\ x &= 3 \end{aligned}$$

(3, 0)

y-int

$$\begin{aligned} -4x - 3y &= -12 \\ -4(0) - 3y &= -12 \\ -3y &= -12 \\ y &= 4 \end{aligned}$$

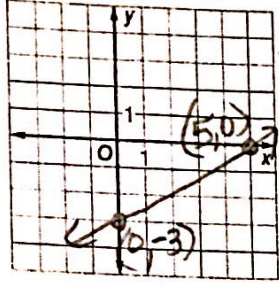
(0, 4)

Skills Practice

Graph a Line Using Intercepts P.4

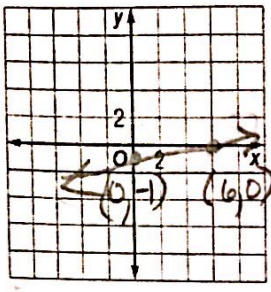
State the x- and y-intercepts of each function. Then graph the function.

1. $3x - 5y = 15$



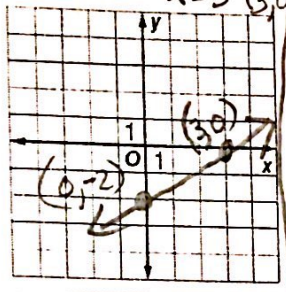
Xint yint
 $x=5$ $y=-3$
 $(5,0)$ $(0,-3)$

2. $-\frac{1}{2}x + 3y = -3$



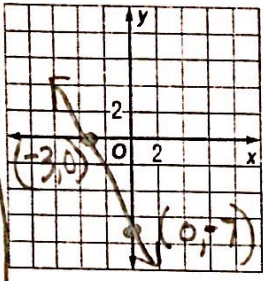
Xint yint
 $x=6$ $y=-1$
 $(6,0)$ $(0,-1)$

3. $4x - 6y = 12$



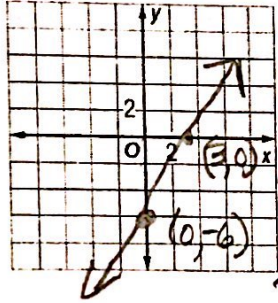
Xint yint
 $x=3$ $y=-2$
 $(3,0)$ $(0,-2)$

4. $7x + 3y = -21$



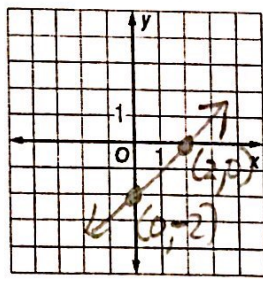
Xint yint
 $x=-3$ $y=-7$
 $(-3,0)$ $(0,-7)$

5. $\frac{2}{3}x - \frac{1}{3}y = 2$



X-int y=0
 $\frac{2}{3}x - \frac{1}{3}y = 2$
 $\frac{2}{3}x - \frac{1}{3}(0) = 2$
 $\frac{2}{3}x - 0 = 2$
 $\frac{2}{3}x = 2$
 $x = \frac{2 \cdot 3}{2} = 3$
 $x = \frac{6}{2} = 3$
 $x = 3$ (3,0)

6. $-x + y = -2$

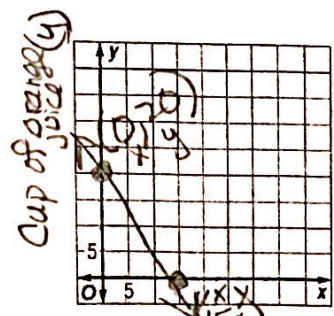


Xint yint
 $x=2$ $y=-2$
 $(2,0)$ $(0,-2)$

7. **DRINKS** Ms. Purdy bought coffee and orange juice for her coworkers in her office. She bought x cups of coffee at \$2 per cup and y cups of orange juice at \$1.50 per cup. Altogether she spent \$30. This can be represented by the function $2x + 1.5y = 30$. Graph the function. Then interpret the x- and y-intercepts.

Xint when $y=0$
 $2x + 1.5(0) = 30$
 $2x + 0 = 30$
 $2x = 30$
 $x = 15$
 $(15,0)$

yint when $x=0$
 $2(0) + 1.5y = 30$
 $0 + 1.5y = 30$
 $1.5y = 30$
 $y = 20$
 $(0,20)$



Interpret:
 Equations in Two Variables
 If Ms. Purdy buys 15 cups of coffee, she can't buy any orange juice.
 If she buys 20 cups of orange juice, she can't buy any coffee.