

**Unit 2: Solving Equations and Inequalities**  
**Lesson 2: Graphing Linear Equations**

A **linear equation** has no operations other than addition, subtraction, and multiplication of a variable or a constant.

Linear Equations	Not Linear Equations

Any **linear function** can be written in the form  $y = mx + b$  where  $m$  and  $b$  are real numbers.

State whether each function is a linear function. Explain.

a.  $f(x) = 10 - 5x$

b.  $g(x) = x^4 - 5$

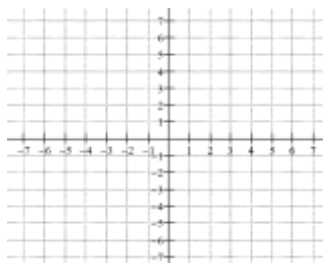
c.  $h(x, y) = 2xy$

**Example 1.** The linear function  $P(d) = 62.5d + 2117$  can be used to find the pressure (lb/ft<sup>2</sup>)  $d$  feet below the surface of the water. Find the pressure at a depth of 350 feet. Remember your units.

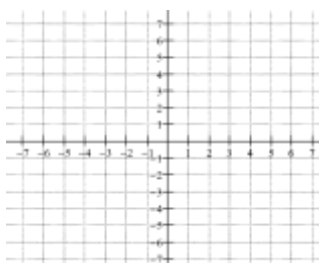
**SLOPE-INTERCEPT FORM:**  
 $y = mx + b$   
 where  $m$  is the slope and  $b$  is the y-intercept.

**Graph each equation.**

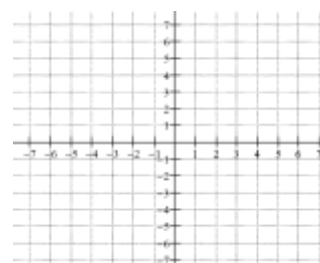
a.  $y = -2x + 3$



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



c.  $2y = 3x + 5$



## STANDARD FORM:

$$Ax + By = C$$

where  $A$ ,  $B$ , and  $C$  are integers whose greatest common factor is 1,  $A \geq 0$ , and  $A$  and  $B$  are not both zero.

Write each equation in standard form. Identify  $A$ ,  $B$ , and  $C$ .

a.  $y = -2x + 3$

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

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

Equation: \_\_\_\_\_  
A: \_\_\_\_\_  
B: \_\_\_\_\_  
C: \_\_\_\_\_

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C: \_\_\_\_\_

Find the  $x$ -intercept and the  $y$ -intercept of the graph of each equation. Then graph the equation.

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

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

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

$x$ -intercept: \_\_\_\_\_

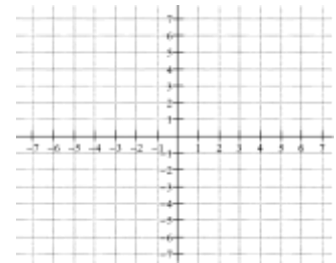
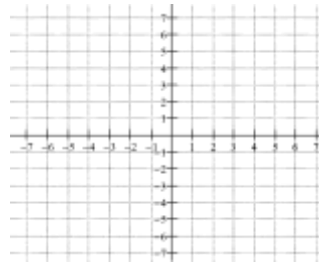
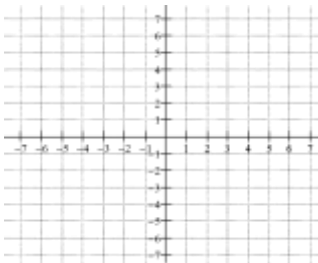
$x$ -intercept: \_\_\_\_\_

$x$ -intercept: \_\_\_\_\_

$y$ -intercept: \_\_\_\_\_

$y$ -intercept: \_\_\_\_\_

$y$ -intercept: \_\_\_\_\_



**Journal prompt:** One way to remember something is to explain it to another person. Suppose that you are studying this lesson with a friend who thinks that she should let  $x = 0$  to find the  $x$ -intercept and let  $y = 0$  to find the  $y$ -intercept. How would you explain to her how to remember the correct way to find intercepts of a line?