

Slope-Intercept & Standard Form:

PROBLEM 24 Good Form!



Convert each given equation to the form indicated.
Then, identify the x-intercept, y-intercept, and the slope.
Show your work for each.

1. $6x + 5y = 20$

a. slope-intercept form:

$$\begin{array}{r} 6x + 5y = 20 \\ -6x \quad -6x \\ \hline 5y = -6x + 20 \\ \frac{5}{5} \quad \frac{5}{5} \\ y = -\frac{6}{5}x + 4 \end{array}$$

c. y-intercept:

(make $x=0$)

$$y = -\frac{6}{5}(0) + 4$$

$$y = 4 \quad \boxed{(0, 4)}$$

b. x-intercept:

(make $y=0$)

$$\begin{array}{r} 0 = -\frac{6}{5}x + 4 \\ -4 \quad -4 \\ \hline 5(-4) = \left(-\frac{6}{5}x\right)5 \\ -20 = -\frac{6x}{1} \\ \frac{-20}{-6} = \frac{-6x}{-6} \\ \frac{10}{3} = x \end{array}$$

$$\boxed{\left(-\frac{10}{3}, 0\right)}$$

d. slope:

$$-\frac{6}{5}$$

Remember, to convert to slope-intercept form, solve for y. To convert to standard form, get both variables on the same side and the constant on the other.



2. $y = -\frac{2}{3}x + 10$

a. standard form:

$$y = -\frac{2}{3}x + 10$$

$$3y = 3\left(-\frac{2}{3}x + 10\right)$$

$$\begin{array}{r} 3y = -2x + 30 \\ +2x \quad +2x \end{array}$$

$$\boxed{2x + 3y = 30}$$

c. y-intercept:

(make $x=0$)

$$2(0) + 3y = 30$$

$$3y = 30$$

$$y = 10$$

$$\boxed{(0, 10)}$$

b. x-intercept:

(make $y=0$)

$$2x + 3(0) = 30$$

$$2x = 30$$

$$x = 15$$

$$\boxed{(15, 0)}$$

d. slope:

$$-\frac{2}{3}$$

Literal Equations:



Literal equations are equations in which the variables represent specific measures. You most often see literal equations when you study formulas. These literal equations can be manipulated in order to allow you to solve for one specific variable.



A common literal equation for the volume of a box is: $V = l \cdot w \cdot h$

1. Solve the volume formula for the height of the box.

$$\begin{aligned} V &= lwh \\ \frac{V}{lw} &= h \end{aligned}$$

2. The bottom of a box measures 10 inches long by 20 inches wide. If the volume of the box is 550 cubic inches, what is the height of the box? Show how you got your answer.

$$\begin{aligned} l &= 10 \\ w &= 20 \\ v &= 550 \\ h &= ? \end{aligned}$$

$$\begin{aligned} h &= \frac{V}{lw} \\ &= \frac{550}{(20 \cdot 10)} \\ &= \frac{550}{200} \\ &= 2.75 \text{ inches.} \end{aligned}$$

A common literal equation for converting Celsius to Fahrenheit is: $C = \frac{5}{9}(F - 32)$.

3. Solve the formula for F.

$$\begin{aligned} C &= \frac{5}{9}(F - 32) \\ 9C &= 5(F - 32) \\ 9C &= 5F - 160 \end{aligned}$$

$$\begin{aligned} \frac{9C}{5} + \frac{160}{5} &= \frac{5F}{5} \\ \frac{9}{5}C + 32 &= F \end{aligned}$$

4. Determine the degrees Fahrenheit that is equivalent to 20° Celsius. Show how you got your answer.

$$\begin{aligned} F &= \frac{9}{5}(20) + 32 \\ &= 9(4) + 32 \\ &= 36 + 32 \\ &= 68^\circ \end{aligned}$$

Analyzing Problem Situations:



Alexis is a flower vendor who grows and sells her own fresh-cut flowers. She has a stand in the city, and she distributes flowers to pedestrians during the day. She charges \$5 for each flower, and each month she randomly gives away two flowers for free.

$$\text{Rate} = 5 \frac{\$}{\text{flower}}$$

1. Identify the independent and dependent quantities in this problem situation.

Ind: # flowers sold
Dep: money earned in \$.

2. Write a linear function, $a(x)$, to represent how much money Alexis earns each month. Use x to represent the number of flowers she sells each month. Write the function in simplest form.

a. $a(x) = 5(x-2)$

$a(x) = 5x - 10$

- b. What property did you use to write the simplified form of the function?

Distributive (over subtraction)

Remember, she gives away 2 flowers each month. How would you represent this information?



3. Describe the function. Is it increasing or decreasing? Is it discrete or continuous? Explain your reasoning.

Increasing: money earned goes up as # of flowers sold goes up.

Discrete: you can't sell a portion of a flower.

4. How much will Alexis earn in a month if she distributes 45 flowers? Show your work.

↑
Input

$$\begin{aligned} a(45) &= 5(45) - 10 \\ &= 225 - 10 \\ &= \$215 \end{aligned}$$

5. How many flowers does Alexis distribute in a month if she earns \$300? Show your work.

↑
output.

$$\begin{aligned} 300 &= 5x - 10 \\ +10 &\quad +10 \\ \hline 310 &= 5x \\ \frac{310}{5} &= \frac{5x}{5} \\ 62 &= x \\ \text{flowers.} & \end{aligned}$$

