Real-life examples of Direct Variation:

- # of hours worked and the amount of your paycheck
- # of links in a chain and the length of a chain
- # of gallons of gas purchased and the amount you pay the cashier
- The number of minutes you walk and the number of calories burned

---

Remember the phrase: "Y varies directly with X"

The number of miles (y) a car can drive varies directly with the number of gallons (x) of gas used.

I was able to drive 471 miles and used 15 gallons.

1. What is the variation constant?

$y = \frac{k}{x} = \frac{471\text{ mi}}{15\text{ gal}} = 31.4\ \text{mi/gal}$

2. Write a direct variation equation.

$y = 31.4x$

3. Find the number of gallons needed to travel 1000 miles.

$\frac{1000}{31.4} = \frac{31.4x}{31.4}$

$x = 31.85\text{ gal}$

The point (6,11) is on the graph of a direct variation relationship.

Write an equation for this Direct Variation.

$k = \frac{y}{x} = \frac{11}{6}$

put this in the eq where k is

$y = \frac{11}{6}x$

The slope of a direct variation graph is 4.5

$k = 4.5$

Does this direct variation contain the point (6, 27) ?

write the eq for the direct variation line

$y = 4.5x$

$27 = 4.5(6)$ plug in (6,27)

$27 = 27$

since (6,27) makes the eq of the line true it must be on the line

Y varies directly with X.

If y = 8 when x = 30, find x when y = 100

You can use a proportion: $\frac{8}{30} = \frac{100}{x}$

$x = 375$

If y = 125 when x = 64, find y when x = 20

OR $k = \frac{125}{64} = 1.953125$

EQ: $y = 1.953125x$

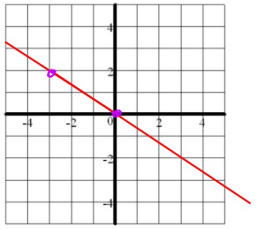
Replace x with 20

$y = 1.953125(20)$

$y = 39.0625$

Graphing Direct Variation.

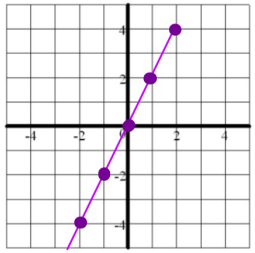
1. Graph the direct variation that contains the point (-3,2)



1. plot (-3,2)
2. plot (0,0) → Direct Variation passes through the origin
3. Connect these pts.

Graphing Direct Variation.

2. Graph this direct variation: y = 2x



b=0

$m = \frac{2}{1}$

This ordered pair is from the same Direct Variation. Find the missing value

(4,18) and (x,45)

$k = \frac{18}{4} = 4.5$

write an eq:

$y = 4.5x$

replace y with 45 & find x:

$\frac{45}{4.5} = \frac{4.5x}{4.5}$

$x = 10$

or use a proportion

$\frac{18}{4} = \frac{45}{x}$

and cross-multiply

$x = 10$

This ordered pair is from the same Direct Variation.
Find the missing value

(18,6) and (24,y)

find k: $k = \frac{6}{18} = \frac{1}{3}$

write an eq: $y = \frac{1}{3}x$

replace x with 24 & find y: $y = \frac{1}{3}(24) = 8$

OR use a proportion

$\frac{6}{18} = \frac{y}{24}$

& cross multiply.

$y = 8$

Hwk #11 Sec 2-3

Page 75

Problems 23, 25, 26, 28-31, 35, 36, 42, 43, 46, 47, 52

Graph this function:

$y = -2|x+1| - 3$

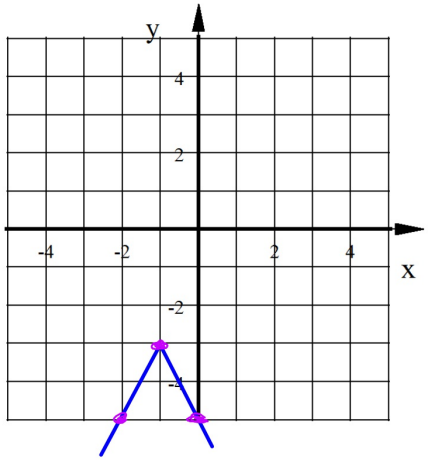
opens down

1 Left

3 down

sides have a slope of 2/1

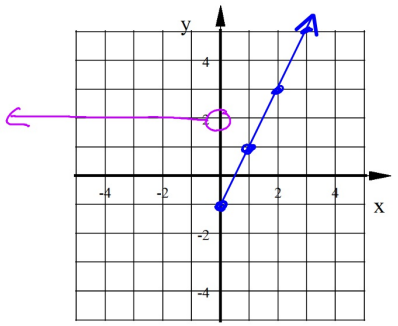
Vertex (-1, -3)



Graph y = 2
but only when x<0

Using the same graph:

Graph y = 2x - 1
but only when x ≥ 0



This graph is called a Piecewise Function

Graph $y = 2$
but only when $x<0$

Graph $y = 2x - 1$
but only when $x \geq 0$

The rule for this piecwise function:

$$f(x) = \begin{cases} 2, \text{ if } x < 0 \\ 2x - 1, \text{ if } x \geq 0 \end{cases}$$

the equation to graph

When to graph it.
The x-values (Domain) when this equation is visible.