Bell Ringer

$$3(2x - 8) - 5x = \frac{1}{4}(16 - 4x)$$

Direct Variation Notes

Direct Variation: when two variable quantities change at a constant rate. An example is $y = 20x$.
  If x (independent variable) increases by 1, then y (dependent variable) increases by 20.
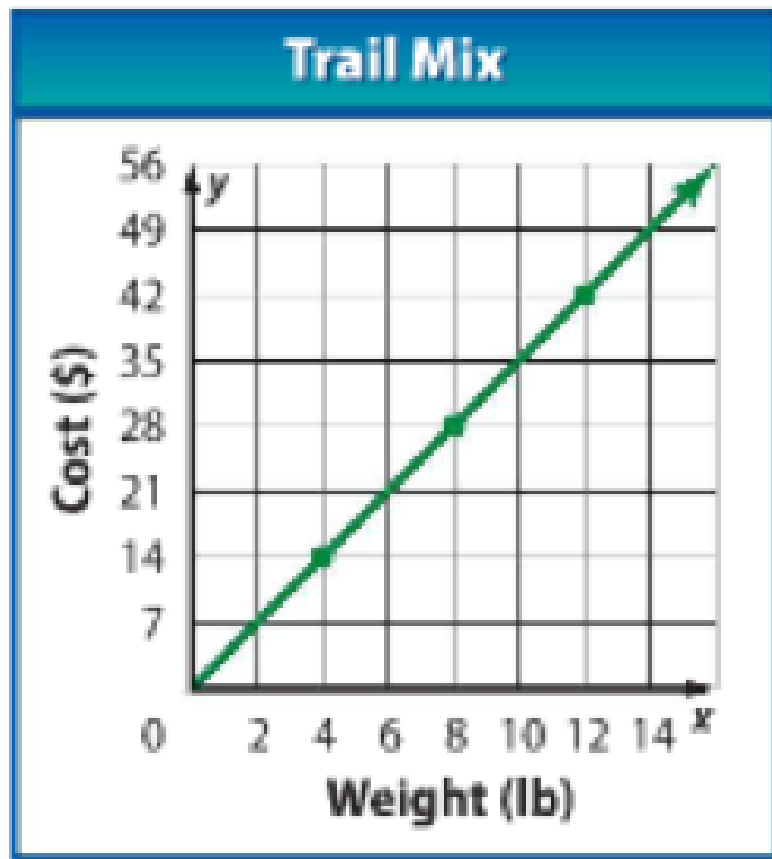
Direct Variation means the ratio of y/x is always the same for each ordered pair.

Direct Variation Model $y = mx$ or $y = kx$ (your book uses this)
  m = slope or the constant of variation or the constant of proportionality

On a direct variation graph, the line MUST pass through the origin (0,0) or the data is not a direct variation.

Example of a Direct Variation Graph

- what is the constant rate of variation?
- what is a model equation for this graph?

Trail Mix

Cost ($) vs Weight (lb)

Cost ($): 7, 14, 21, 28, 35, 42, 49, 56
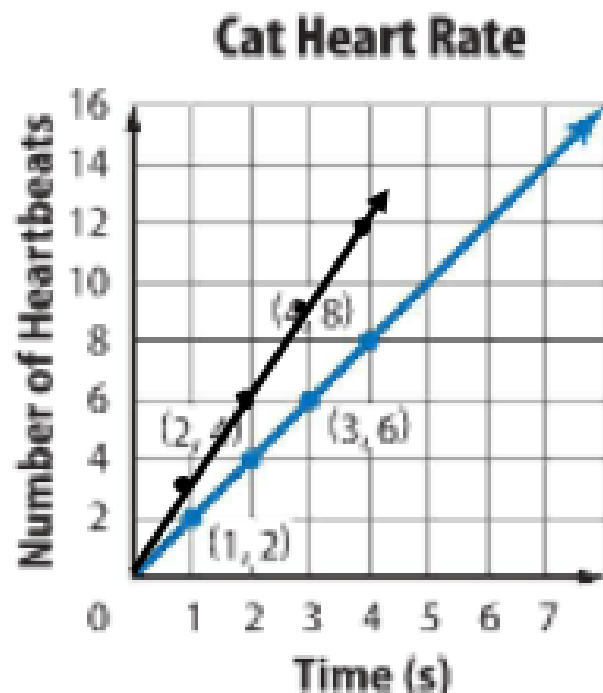Weight (lb): 0, 2, 4, 6, 8, 10, 12, 14

$$\frac{7}{2}, \frac{14}{4}, etc$$

Constant $3.50/lb

$$y = \$3.50x$$

The equation y = 3x represent the heart rate of a rabbit, where x is the time in seconds and y is the number of heart beats.

Does the rabbit or cat have a faster heart rate?
Explain.

rabbit y = 3x

cat y = 2x

Cat Heart Rate

The rabbit's heart rate is faster than the cat's heart rate because 3 beats is faster than 2 beats.

Write an equation that relates x any y directly
when x = 5 and y = 20. (Hint: use y = kx to find k.)

$$y = kx \qquad y = mx \qquad k = \frac{y}{x} = \frac{20}{5} = 4$$

$$20 = k5$$

$$4 = k$$

$$y = 4x$$

Find the value of y when x = 10.

$$y = 4(10)$$

$$= 40$$

The cost of bulk candy varies directly with the weight. At a store, 2 pounds of candy costs $5.80. Write and solve an equation to find the cost of 5 pounds.
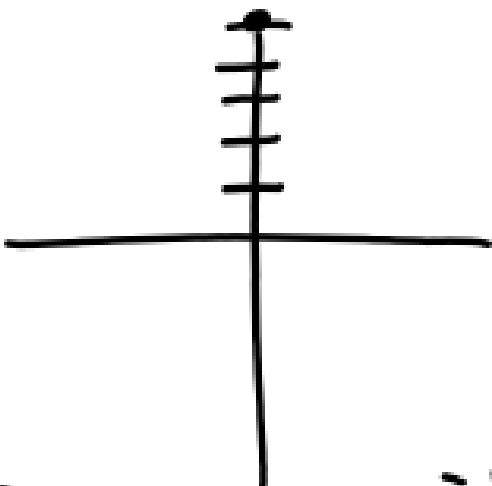
$$k = \frac{y}{x} = \frac{5.80}{2} = \$2.90$$

model

$$y = kx$$

↑

find

$$y = 2.90x$$

$$y = 2.90(5)$$

$$= \$14.50$$

must use the equation method for this chapter

Does the equation y = 25x + 5 model direct variation? Explain.

$\frac{Y}{X}$ is not constant

Graph doesn't
go through (0,0)

X	Y
1	30
2	55

$$\frac{30}{1} \neq \frac{55}{2}$$

must choose values for "x";
using 1 and 2 are selected.
Then solve for y and determine
if a constant exists.