4.8 Problem Solving

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Ex. 1 Crickets chirp about 30 times per minute when the temperature is 48°F, but 110 times per minute when the temperature is 68 °F.

a) Write an equation for this relationship.

b) Predict the number of chirps per minute when the temperature is 80°F.

c) Suppose you hear crickets chirping 200 times per minute. What is the temperature?

ind → temp (x) (48, 30)
dep → # chirps (y) (68, 110)

Let 'x' represent the temp in °F
Let 'y' represent the # of chirps per min

a)

m	b
$m = \frac{y_2 - y_1}{x_2 - x_1}$	$y = mx + b$
$= \frac{110 - 30}{68 - 48}$	$30 = 4(48) + b$
$= \frac{80}{20}$	$30 = 192 + b$
$= 4$	$30 - 192 = b$
	$-162 = b$

$\therefore y = 4x - 162$

b) $x = 80°F$

$y = 4x - 162$
$y = 4(80) - 162$
$y = 320 - 162$
$y = 158$

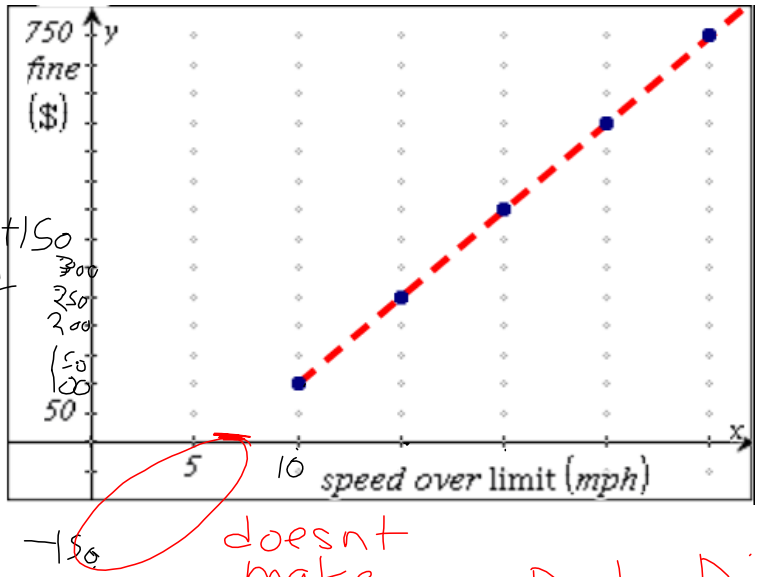
$\therefore$ The number of chirps per minute would be 158

c) $y = 200$

$y = 4x - 162$
$200 = 4x - 162$
$200 + 162 = 4x$
$\frac{362}{4} = \frac{4x}{4}$
$\frac{181}{2} = x$
$90.5°F = x$

$\therefore$ The temp was 90.5° F

Ex. 2 You are the judge in traffic court. A new judge asks you to explain how to determine the fines. What is your explanation?



x	y
10	100
15	250

$\frac{150}{5} = 30$

$m = 30$

doesn't make sense

Data Discrete

$\frac{\Delta y}{\Delta x} = \frac{\$30}{\text{mph}}$

* Don't start charging you until you drive 10 mph over speed limit

$y = mx + b$

$100 = 30(10) + b$

$100 = 300 + b$

$100 - 300 = b$

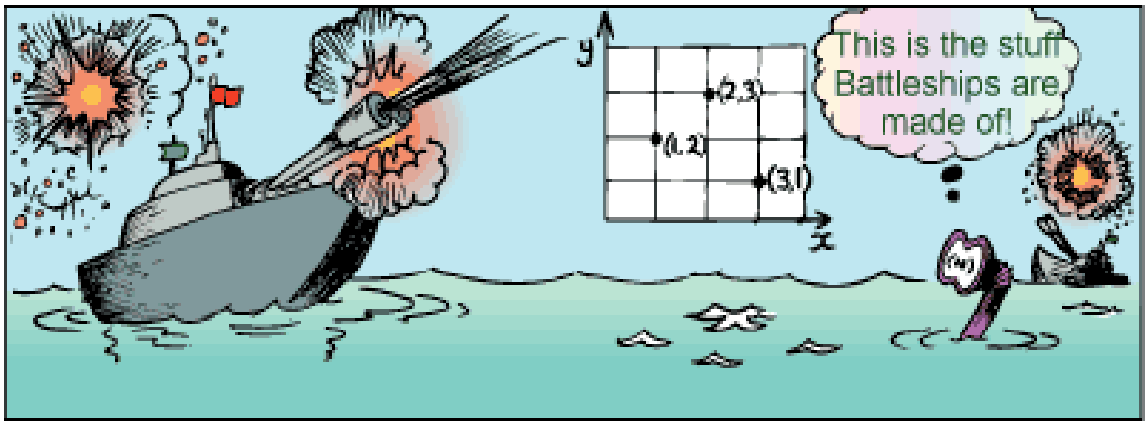
$-200 = b$

$y = 30x - 200$

* use $y = 30x - 200$ to predict charges, if you are MORE than 10mph over speed limit

→ $30 for every mph over limit

Homework:
Handout



Ex. 4 Corey has played 11 basketball games and has a 17-point average.

a) How many points would he need to score in his next game to raise his average 1 point? 2 points?

b) Determine the equation of the line relating increase in average desired and points needed.

c) Explain the meaning of the slope and y-intercept.