Homework Review - "Find the Equation" Worksheet, Section 5.5, Section 5.6

$(1,2)$ $(3,4)$ $2x + 3y = 10$

find slope!

↳ find equation $y = mx + b$

"two points method"

x	y
0	$10/3$
1	$8/3$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{2}{3} \quad (2, y) \quad (4, 6)$$

(17)

(50, -5)

(85, -85)

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{-85 + 5}{85 - 50}$$

$$= \frac{-80}{35}$$

$$= \frac{-16}{7}$$
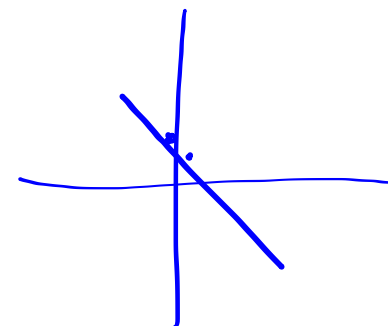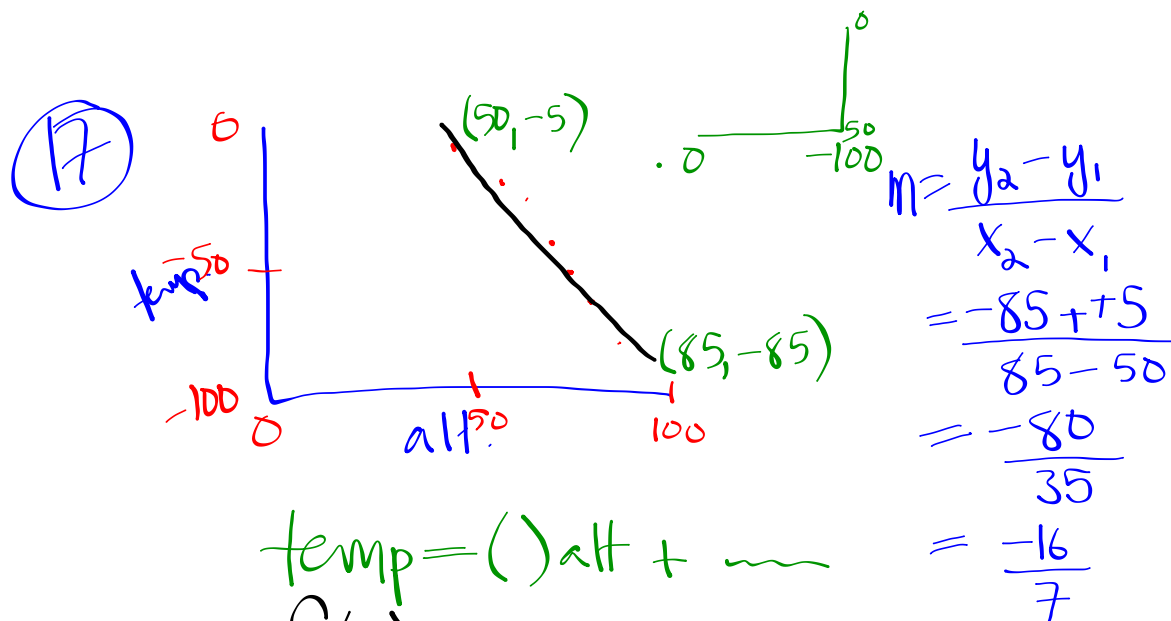
temp = ( )alt + ⎯⎯

$$f(x) = mx + b$$

$$f(x) = \frac{-16}{7}x + b$$

$$f(x) = -2x + 95$$

$$-5 = \frac{-16}{7}(50) + b$$

$$-5 = -2(50) + b$$

$$-5 = -100 + b$$
$$+100 \qquad +100$$

$$95 = b$$

-2 degrees per kilometer

$$y = \frac{17}{107}x + \frac{91}{13} \qquad x = \frac{22}{917}$$

Review - Chapter 4, 5, and 6.7 Test

Sections 4.1 - 4.5, 4.7, 5.1, 5.2, 5.5, 5.6, and 6.7

Teams:

Solve problems on your own FIRST

then compare & revise...

2-3 people

$$m(x) = -8x + 10; \; -6$$

$$\uparrow y \qquad\qquad \uparrow x$$

$$y = -8x + 10$$

solve when $x = -6$

$$m(x) = -8(-6) + 10$$

$$= 48 + 10$$

$$m(x) = 58$$

$$2y - 12x = -6$$

Find X and Y intercepts

x-int: y=0

$2(0) - 12x = -6$

$-12x = -6$

$\dfrac{-12x}{-12} = \dfrac{-6}{-12}$
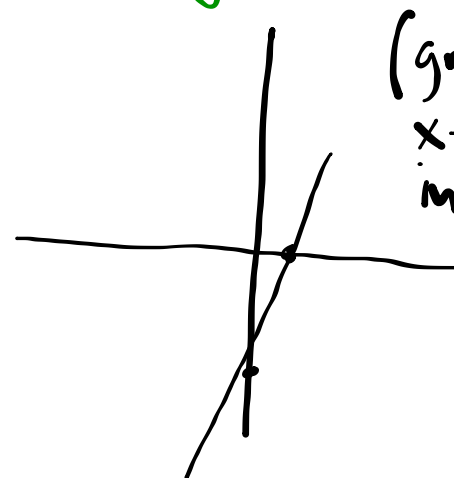
$x = \dfrac{1}{2}$

y-int: x=0

$2y - 12(0) = -6$

$2y = -6$

$\dfrac{2y}{2} = \dfrac{-6}{2}$

$y = -3$
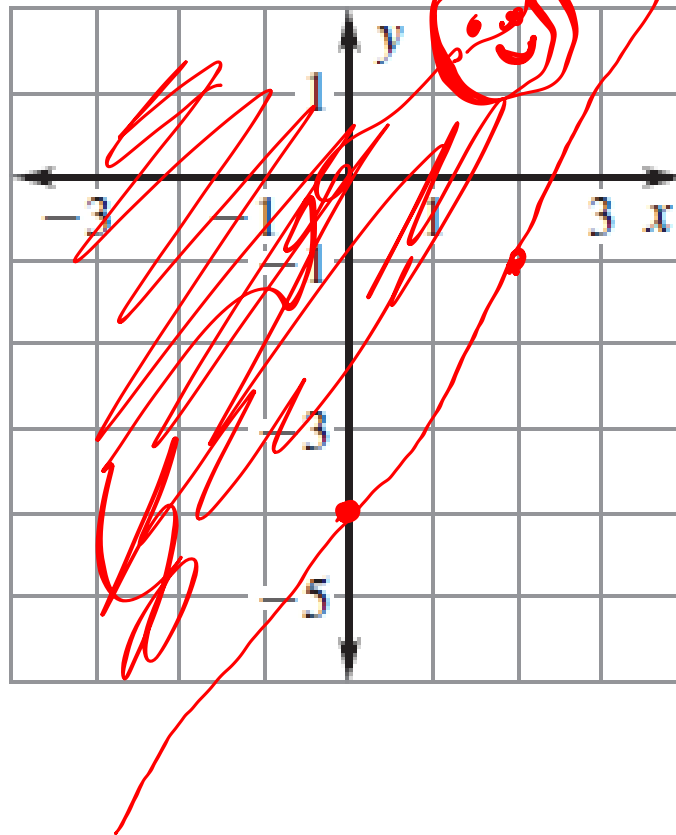
x int. $= \dfrac{1}{2}$ $\left(\dfrac{1}{2}, 0\right)$

y int $= -3$ $(0, -3)$

(graph using
x- & y-
int. method)

$$2y - 3x \geq -8 \quad \text{(graph)}$$

Baboon

$$2y - 3x \geq -8$$
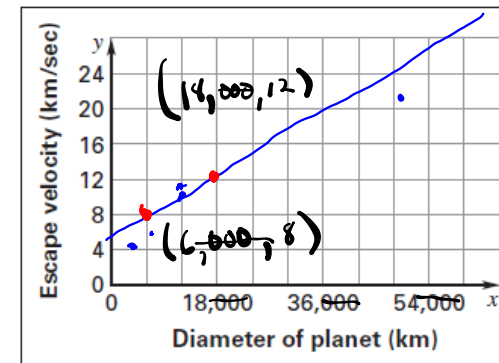$$+3x \qquad +3x$$

$$\frac{2y}{2} \geq \frac{3x - 8}{2}$$

$$y \geq \frac{3}{2}x - 4$$

Escape Velocity The table shows several planet diameters and escape velocities. The escape velocity is the velocity at which an object has to travel in order to escape the effect of a planet's gravity.

Planet	Mercury	Uranus	Earth	Mars	Venus
Diameter (km)	4879	51,118	12,756	6794	12,104
Escape velocity (km/sec)	4.3	21.3	11.186	5.03	10.36

Handwritten annotations on table: Diameter: 5000, ~20,000, ~13,000, 7000, 13,000. Escape velocity: 4, 21, 11, 5, 10.

a. Make a scatter plot of the data. Let x represent the diameter of the planet and let y represent the escape velocity.

b. Find an equation that models the escape velocity (in kilometers per second) as a function of the diameter (in kilometers).

c. Approximate the escape velocity of Neptune, which has a diameter of 49,528 kilometers. (21)

Scatter plot — Escape velocity (km/sec) vs Diameter of planet (km). Points and line drawn, labeled $(18{,}000, 12)$ and $(6{,}000, 8)$.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{12 - 8}{18 - 6} = \frac{4}{12} = \frac{1}{3}$$

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

$$8 = \frac{1}{3}(6) + b$$

$$8 = 2 + b$$

$$b = 6$$

$$\boxed{y = \frac{1}{3}x + 6}$$
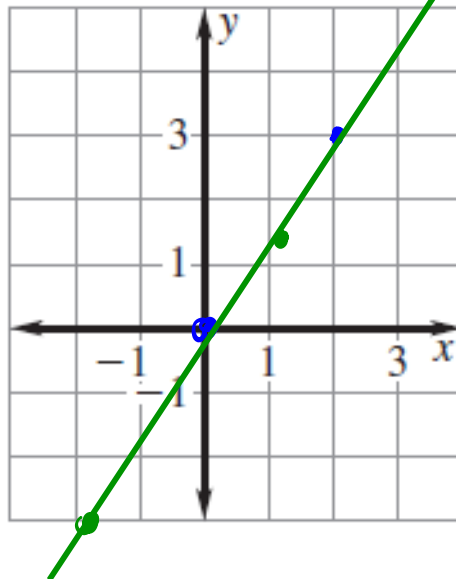
$$y = \frac{1}{3000}x + 6$$

$$y = \frac{1}{3}(49.528) + 6$$

$$16.509 + 6 = 22.50$$

8

$$
3 \overline{\smash{\big)}\ 49,528} \quad 16.509
$$

```
          1 6 . 5 0 9
     _____
3 ) 4 9 , 5 2 8
    3
    ‾‾
    1 9
    1 8
    ‾‾
      1 5
         2 8
         2 7  .
```

$$3x - 2y = 0$$

Use "Two Points" Method

$$3x - 2y = 0$$
$$-3x \qquad -3x$$

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

$$y = \frac{3}{2}x$$

x	y
1	$\frac{3}{2}$
-2	-3

$$3(1) - 2y = 0$$
$$3 - 2y = 0$$
$$-3 \qquad -3$$
$$-2y = -3$$
$$\frac{-2y}{-2} = \frac{-3}{-2}$$
$$y = \frac{3}{2}$$

$$\left(1, \frac{3}{2}\right)$$

$$(-2, -3)$$

$$3(-2) - 2y = 0$$
$$-6 - 2y = 0$$
$$+6 \qquad +6$$
$$-2y = 6$$
$$\frac{-2y}{-2} = \frac{6}{-2} \qquad y = -3$$

$x_1 \quad y_1 \qquad x_2 \quad y_2$

$(7, 5), (x, 2); m = \dfrac{3}{4}$

↑ find

$(3, 2)$

$m = \dfrac{y_2 - y_1}{x_2 - x_1}$

$\dfrac{3}{4} = \dfrac{2 - 5}{x - 7}$

$\dfrac{3}{4} \quad \dfrac{-3}{x - 7}$

$3 \cdot (x + 7) = 4 \cdot -3$

$3x - 21 = -12$

$ + 21 \qquad +21$

$\dfrac{3x}{3} = \dfrac{9}{3}$

$x = 3$

$f(-4) = -2, f(2) = 7$

graph

$f(x) = mx + b$

$y = mx + b$

$x = -4$
$y = -2$

$x = 2$
$y = 7$

$(-4, -2)$

$(2, 7)$

$M = \dfrac{y_2 - y_1}{x_2 - x_1} = \dfrac{7 + {}^+2}{2 + {}^+4} = \dfrac{9}{6} = \dfrac{3}{2}$

$y = \dfrac{3}{2}x + b$

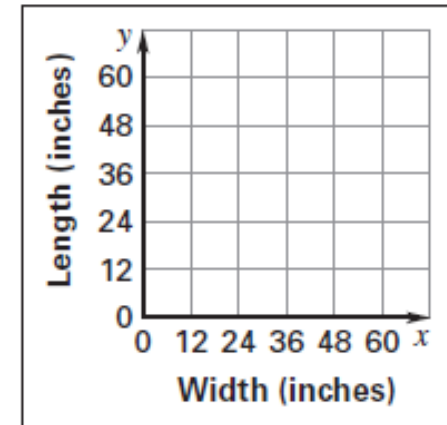$-2 = \dfrac{3}{2}(-4) + b$

$y = \dfrac{3}{2}x + 4$

$-2 = \dfrac{-12}{2} + b$

$-2 = -6 + b$
$+6 \quad +6$

$b = 4$

Rabbit Hutch The cage that you keep your rabbit in has a perimeter of 118 inches. Let x be the cage's width (in inches) and let y be its length (in inches).

a. Write an equation for the perimeter.

b. Find the intercepts of the graph of the equation you wrote. Then graph the equation.

Homework: (Suggested)

p. 272, 9-17 odd, 18-21, 30, 31, 34
p. 345, 7-10, 18-21
p. 418, 38-44 even