b) Interpret the slope as a rate of change.

For every 25km travelled, the car uses 3L of gas

c) Graph this relationship.
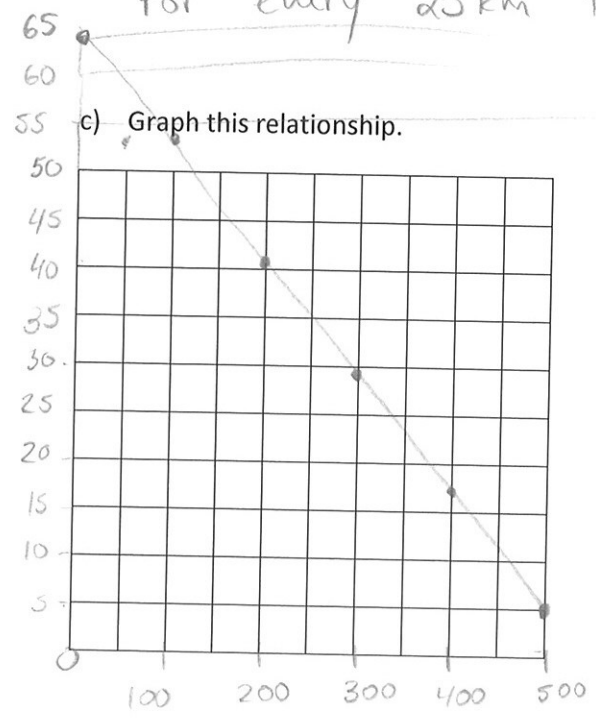
d) What does a negative slope look like?

It goes down to the right

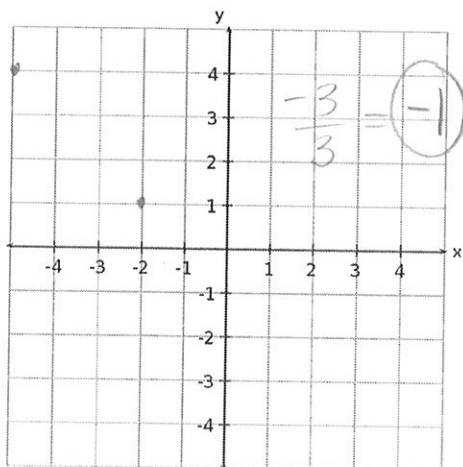**Homework:** Pg 267, C1, C2 pg 268 #1-10, 13, 18

These are the different ways we can now say "slope"

$$\text{Slope} = m = \frac{\text{rise}}{\text{run}} = \frac{\Delta y}{\Delta x} = \frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1}$$
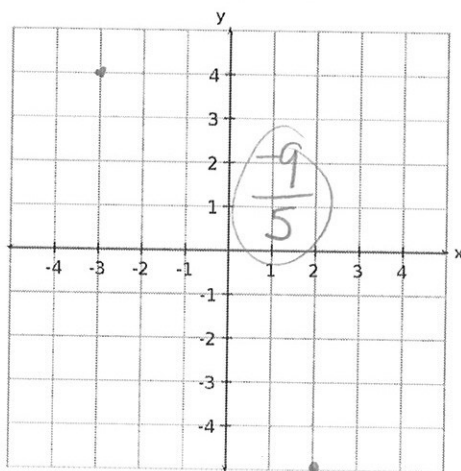
Practice 2 – Slope as a Rate of Change

9. Plot the following pairs of points on separate graphs, draw the line that passes through them, and calculate the slope using the slope formula.
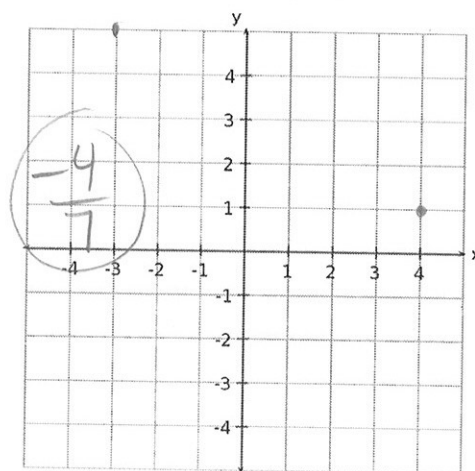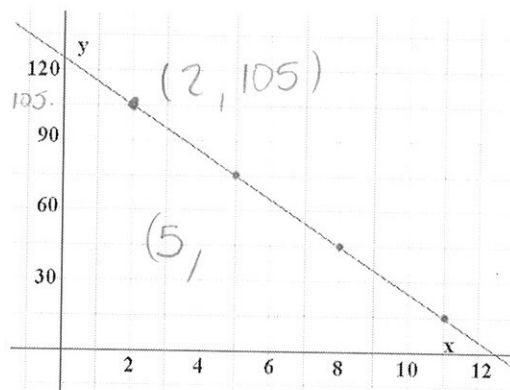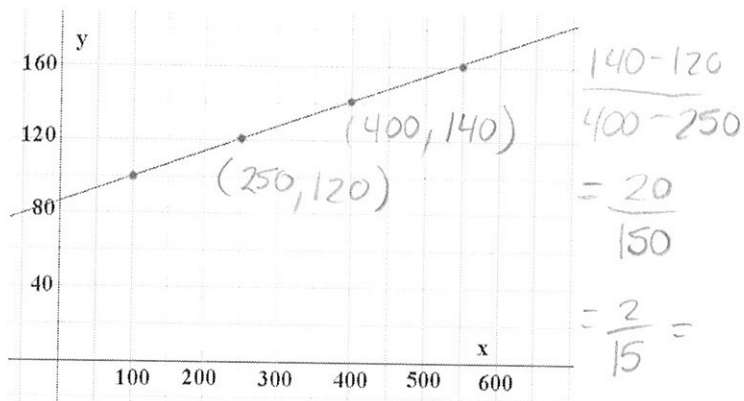
a. (−2, 1) (−5, 4) b. (2, −5) (−3, 4) c. (−3, 5) and (4, 1)

$\frac{-3}{3} = \boxed{-1}$ $\boxed{\frac{-9}{5}}$ $\boxed{\frac{-4}{7}}$

10. Find the slope of each line pictured below

(400, 140)
(250, 120)

$\frac{140-120}{400-250} = \frac{20}{150} = \frac{2}{15} =$

(2, 105)
(5,

11. Find the slope of the line that passes through each pair of points.

a. (1,2) and (7, 9)

$\frac{9-2}{7-1} = \boxed{\frac{7}{6}}$

b. (-5, 3) and (-1,0)

$\frac{3-0}{-5-(-1)} = \frac{3}{-4} = \boxed{\frac{-3}{4}}$

c. (5,-1) and (0, 3)

$\frac{3-(-1)}{0-5} = \frac{4}{-5} = \boxed{\frac{-4}{5}}$

d. (6,2) and (6,-5)

$\frac{-5-2}{6-6} = \frac{-7}{0}$ $\boxed{= \text{undefined}}$

e. (12,5) and (9,8)

$\frac{8-5}{9-12} = \frac{3}{-3} = \boxed{-1}$

f. (-3,-7) and (-8, -1)

$\frac{-1-(-7)}{-8-(-3)} = \frac{6}{-5} = \boxed{\frac{-6}{5}}$

g. (3,-5) and (0,0)

$$\frac{-5-0}{3-0} = \boxed{\frac{-5}{3}}$$

h. (2, ¾) and (4, ¼)

$$\frac{\frac{3}{4} - \frac{1}{4}}{2-4} = \frac{\frac{2}{4}}{-2}$$

$$= \frac{0.5}{-2} = \boxed{-0.25}$$

i. (½, 2/3) and (0, 1/3)

$$\frac{\frac{2}{3} - \frac{1}{3}}{\frac{1}{2} - 0} = \frac{\frac{1}{3}}{\frac{1}{2}}$$

$$\frac{1}{3} \div \frac{1}{2} = \frac{1}{3} \times \frac{2}{1} = \boxed{\frac{2}{3}}$$

12. Use the slope formula to determine the slope of the line that passes through each set of points

a. (5, 7) and (2, 1)

$$\frac{7-1}{5-2} = \frac{6}{3} = \boxed{2}$$

b. (3, −5) and (−2, 4)

$$\frac{-5-4}{3-2} = \frac{-9}{1} = \boxed{-9}$$

c. (−4, −5) and (6, −1)

$$\frac{-1-(-5)}{6-(-4)} = \frac{4}{10} = \boxed{\frac{2}{5}}$$

✳ d. (4, 6) and (4, −2)

$$\frac{6-(-2)}{4-4} = \frac{8}{0}$$

$$\boxed{= \text{undefined}}$$

e. (3, 4) and (−2, 8)

$$\frac{8-4}{-2-3} = \frac{4}{-5} = \boxed{\frac{-4}{5}}$$

f. (−9.8, −3.1) and (−4.2, 7.3)

$$\frac{7.3-(-3.1)}{-4.2-(-9.8)} = \frac{10.4}{5.6} = \frac{104}{56}$$

$$\boxed{= \frac{13}{7}}$$

13. Given the slope of the line segment and the other end point, determine the unknown.

a. (0, 5), (a, 1), slope 2

$$(-a)(2) = \left(\frac{5-1}{0-a}\right)(-a)$$

$$\frac{-2a}{-2} = \frac{4}{-2}$$

$$\boxed{a = -2}$$

✗ b. (b, 0), (10, 9), slope

✗ c. (17, 21), (c, 5), slope 32 /8

f) $\frac{75}{12} = \frac{4-f}{7-3}$

$4\left(\frac{15}{12}\right) = \left(\frac{4-f}{4}\right)4$

$\frac{300}{12} = 4-f$

$25-4 = -f$

$21 = -f \longrightarrow \boxed{-21 = f}$

✗ e. (17, e), (32, 9), slope

d. (7, 12), (12, d), slope 6

$$\frac{12-d}{7-12} = 6$$

$$-5\left(\frac{12-d}{-5}\right) = (6)(-5)$$

$$12-d = -30$$

$$\begin{array}{ll} -d = -30 -12 \\ -d = -42 \\ \frac{-d}{-1} = \frac{-42}{-1} \\ \boxed{d = 42} \end{array}$$
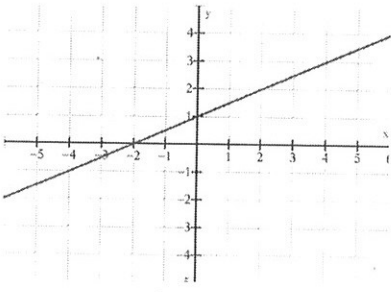
f. (3, f), (7, 4), slope 75 /12

y-intercept

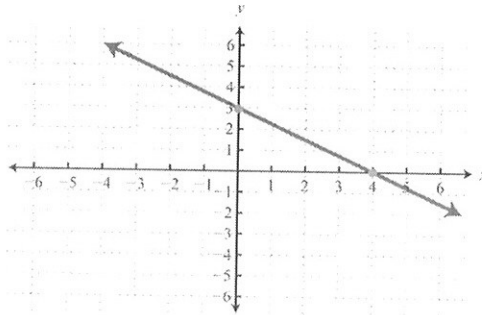The **y-intercept** is the point where the **line crosses the y-axis**.

At the y-intercept, the **x-coordinate is always zero**. For example, (0, 12), (0, -4), (0, 13.56), and (0, -101) are all possible y-intercepts.
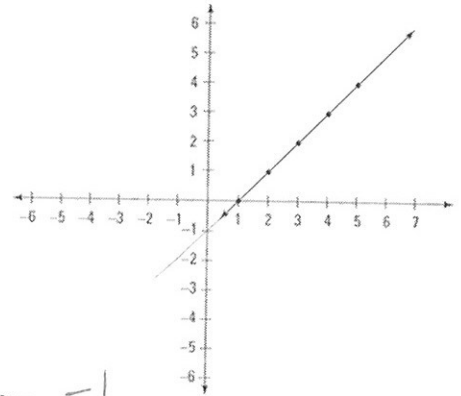
Another way of saying "y-intercept" is **"b"**
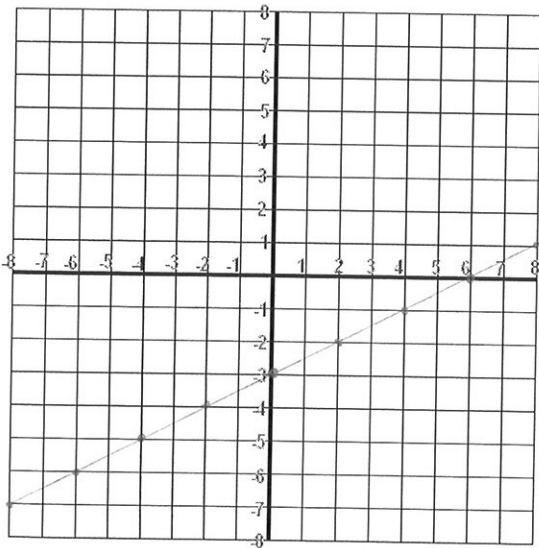
Ex 9. Identify the y-intercept on each graph.

b= __1__   b= __3__   b= __-1__
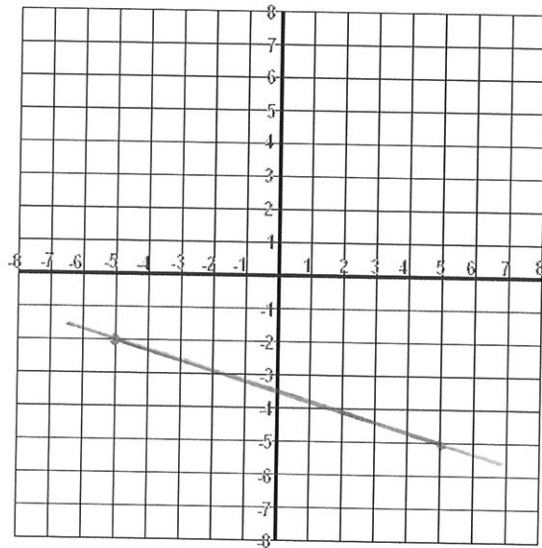
Ex 10. Draw a line that has a y-intercept of –3, and a slope of $\frac{1}{2}$

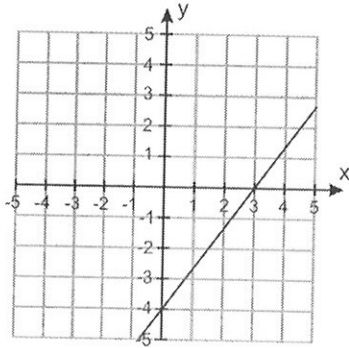**Ex 11.** What is the y-intercept of a line that goes through the points (–5, –2) and (5, –5)?

$b = -3.5$

Practice 3 – y-intercepts

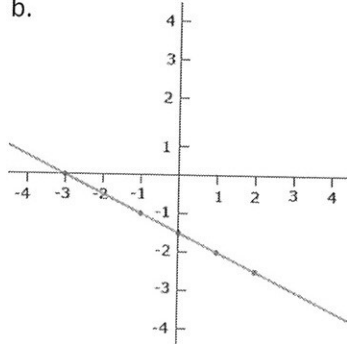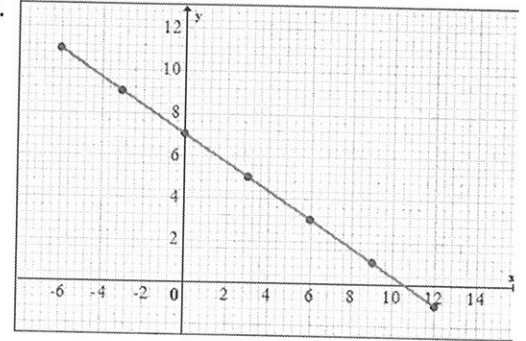1. Identify the y-intercept for each line

a.

b = ___-4___

b.

b = ___-1.5___
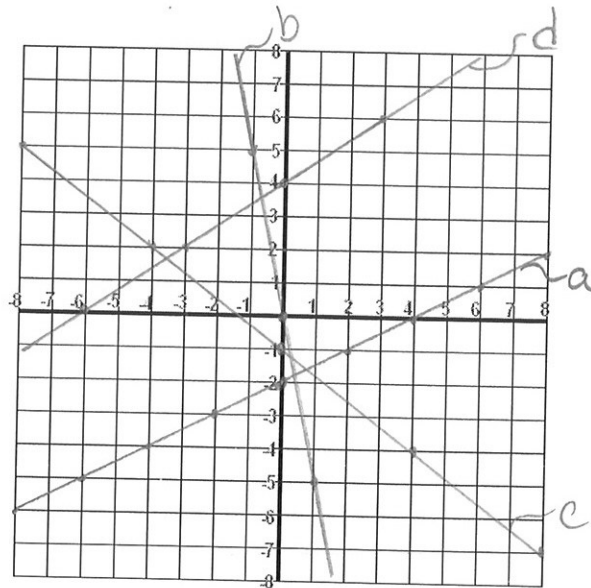
c.

b = ___7___

2. Draw and label each line:

a) a y-intercept of –2 and a slope of $\frac{1}{2}$

b) slope of –5 and a y-intercept of 0

c) b = –1 and m = $\frac{-3}{4}$

d) The line intercepts the y-axis at 4, the rise is 2, and the run is 3

3. Draw each line and find the y-intercept

a) Passes through (4,4) and (–4,0)

b = ___2___

b) Passes through (2,0) and (1, –3)

b = ___-6___

c) Passes through (–4, –6) and (–8, –5)

b = ___-7___

d) Passes through (–8, 3) and (4, –1.5)

b = ___0___