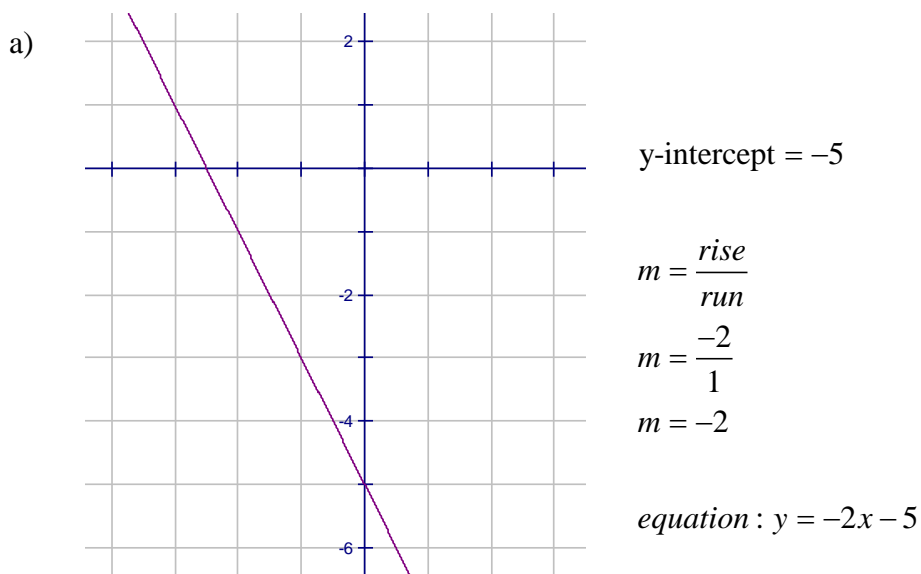


Course: MFM2P Gr. 10 AppliedLesson: 3 - 5Unit: Linear RelationsTopic: Determining and Equation of a Line✚ *homework check:* Lesson 3 - 4✚ *note:* Determining the Equation of a Line

Writing the equation of any line involves knowledge of *the slope (or rate of change)* and any other point on the line. It is easiest to write the equation if the identified point is the y-intercept, but it is still possible to write the equation of the line using *any point* on the line. For example, find the equation of the given lines.



b) $m = -5$, $A(-2, 1)$ so we substitute into $y = mx + b$ form

$y = -5x + b$ and then we substitute the point in for (x, y)

$$1 = -5(-2) + b$$

$$1 = 10 + b$$

$-9 = b$ then write the equation using the information found

$$y = -5x - 9$$

c)

points $A(5, 2)$ and $B(3, -4)$ are on the line

$$m = \frac{2 - (-4)}{5 - 3}$$

$$m = \frac{6}{2}$$

 $m = 3$ and substitute into $y = mx + b$
 $y = 3x + b$ and use one of the points to substitute for (x, y)

$$2 = 3(5) + b$$

$$2 = 15 + b$$

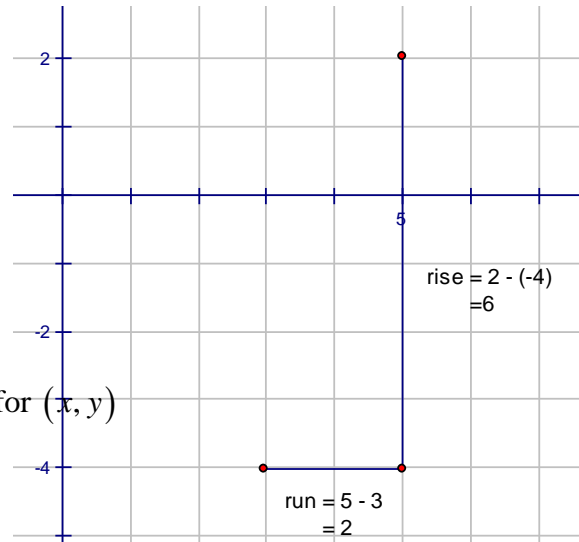
$$2 - 15 = b$$

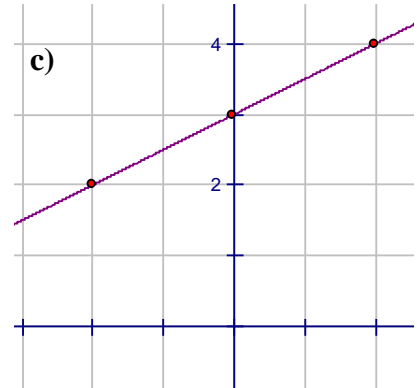
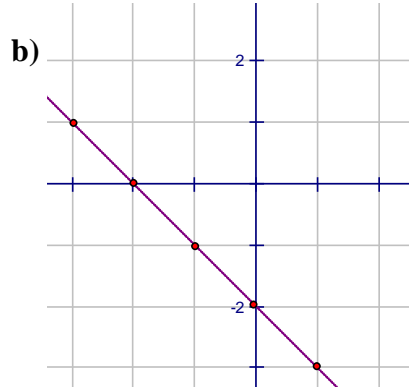
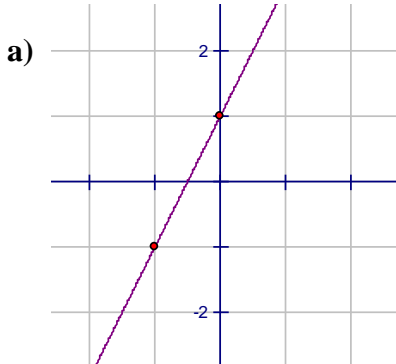
 $-13 = b$ and substitute to write the equation

$$y = 3x - 13$$

Note: *Drawing a useful diagram can always help to determine the slope using a rate triangle!
Also note that we can find an equation from either a graph or points!*

✎ homework assignment: Lesson 3 - 5



Lesson 3 – 5: Determining Equations of Lines**1. Write the equation of each line shown.****2. Write the equation of the line given the following information.**

- a) slope = 1, y-intercept = -1 b) slope = 3, y – intercept = -2 c) slope = $-\frac{1}{2}$, y–intercept=2

3. Madeline plans to upgrade her car stereo and needs \$400 in equipment. She currently has \$50 in the bank and plans to save \$25 each week.

- a) Write an equation that represents Madeline’s savings plan.
- b) After how many weeks will Madeline have enough money?

4. Determine the equation of each line given the slope and another point on the line that is not the y-intercept.

- a) $m = 2$, A(4, 4) b) $m = -1$, B(3, 7) c) slope = -3, C(2, -1)

d) $m = -\frac{1}{2}$, D(-2, 4)

e) $m = \frac{1}{2}$, E(1, -3)

f) slope = $\frac{-3}{2}$, F(-4, 1)

5. Solve each equation for b.

a) $9 = 3(2) + b$

b) $-8 = 3(-3) + b$

c) $0 = -3(-7) + b$

6. Determine the equation of each line given two points, neither of which are the y-intercept. Use $m = \frac{y_2 - y_1}{x_2 - x_1}$ to calculate the slope first.

a) A(2,2), B(3,7)

b) C(-1,4), D(5,12)

c) E(-2,-3), F(2,5)

d) G(-2,-3), H(1,6)

e) I(-9,0), J(3,-8)

f) K(-25,16), L(15,0)