

**Linear Equations Homework Day 1**

**Directions:** Be sure to show all work, communicate your thought process, and justify your reasoning. Remember to check that your answers are complete, correct, and reasonable. Do not forget to complete the "Throwback" problems! 😊

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**1. Determine the rate of change between each pair of points.**

- a. (-14,0) and (5,-8)                      b. (23,-28) and (3,8)                      c. (17,4) and (0,-13)

**2. For each situation,**

- determine the rate of change
- identify the independent variable
- identify the dependent variable
- design a model (that is, write an equation) for the situation

a. Joan purchased 52 cookies. She planned to also bake cookies each day in preparation for a large event to serve the needy in her community. After three days, Joan had a total of 151 cookies. After five days, Joan had a total of 217 cookies. Assume Joan baked the same amount of cookies per day (other than the first day).

b. Paula drives at a constant speed, beginning 10 miles away from her house. After 2 minutes, she is 11.1 miles away from home, and after 10 minutes, the total distance she traveled from her house is 15.5 miles.

**3. Identify the slope and y-intercept of each line.**

- a.  $-2y + 3x = 18$                       b.  $y = 4$                       c.  $y - 9 = \frac{1}{4}(x + 28)$
- d.  $x = -5$                       e.  $7y - 7x = 21$                       f.  $9x = -y + 108$
- g.  $y + x = -1.25$                       h.  $x - y = -4.8$                       i.  $3x - 4y = -24$

**Throwback**

4. Sanjay is designing a rectangular structure to use as a base for his art project. He wants the length to be exactly 7 inches shorter than the width and he wants the width to be no less than 10 inches long. Sanjay has a total of 78 inches of wood to use for the perimeter of the structure. Determine the range of widths Sanjay can use for this structure. Express your answer as a compound inequality and explain your inequality using a short sentence.

5. Solve for  $x$ .  $wx + rx = fg$

Selected Solutions

1. a.  $-8/19$

2. a. rate of change =  $(217 - 151)/(5-3) = 66/2 = 33$  cookies per day

independent variable: time, in terms of days

dependent variable: number of cookies baked per day

equation:  $y = 33x + 52$  (y: number of cookies, x: number of days)

3. a. slope:  $3/2$

y-intercept:  $(0,-9)$

b. slope: 0

y-intercept:  $(0,4)$

c. slope:  $1/4$

y-intercept:  $(0,16)$

d. slope: undefined

y-intercept: none because the line is vertical

e. slope: 1

y-intercept:  $(0,3)$

5.  $x(w + r) = fg$

so  $x = fg/(w + r)$

restrictions:  $w + r$  cannot equal zero, so  $w$  cannot equal  $-r$ .