IM2 Problem Set 4.3 - Linear Relations & Functions

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BIG PICTURE of this UNIT:	• What is meant by the term FUNCTIONS and how do we work with them? • mastery with working with basics & applications of linear functions • mastery with working with basics & applications of linear systems • understanding basics of function concepts and apply them to lines & linear systems

Part 1 - Skills/Concepts Review

1. For the linear relation $3x + 2y = 9$,

   a. Determine the x- and y-intercepts.
   b. Determine the slope.
   c. Graph this relation.
   d. Evaluate for y if $x = 5$.
   e. Evaluate for x if $y = -2$.

2. Rearrange each equation to complete the table:

| $Ax + By + C = 0$ form	$y = mx + b$ form
$3x + 4y - 6 = 0$	
	$y = 2x - 5$
$4x - 7y - 3 = 0$	
	$y = -\frac{2}{3}x - \frac{5}{6}$

3. The graph included shows Kyle's distance from home as he cycles home from school.

   a. How far is the school from Kyle's home?
   b. What does the ordered pair (10,1.5) mean in this context?
   c. What are the domain and range for this relation?
   d. At what speed does Kyle cycle?

Kyle's Journey Home from School
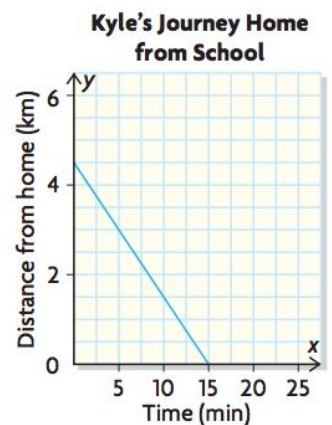
4. The SYMBOLS that make up the notation of $f(-2) = 5$ communicate INFORMATION. (i) Explain what the f means; (ii) explain what the -2 means; (iii) explain what the 5 means; (iv) what are 2 alternative ways to communicate the same information?

5. The table below shows how many sit-ups Samantha did in her PE class.

Time (min)	0.5	1	1.5	2	2.5	3	3.5	4
Sit-Ups Completed	17	33	48	62	72	80	86	91

Number of Sit-Ups Samantha Completed
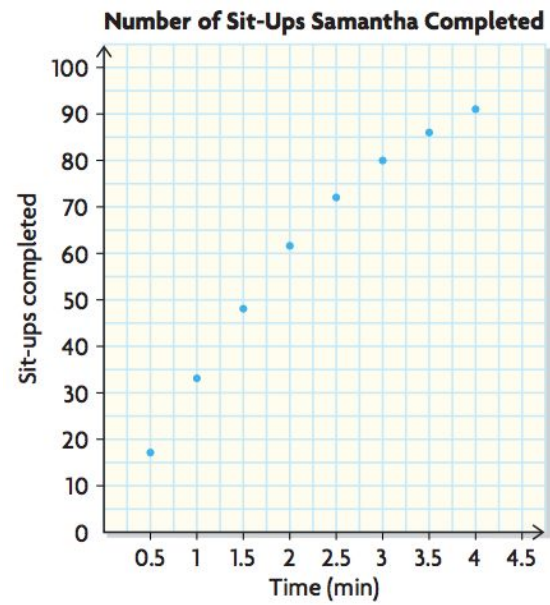
a. Describe the relationship between completed sit ups and time.
b. Is the data discrete or continuous?
c. How many sit-ups would you expect her to do in 105 seconds?
d. How many sit-ups would you expect her to do in 5 minutes? What assumptions are you making in your answer?
e. Could the relationship between time and sit-ups be linear? Explain your reasoning?

## Part 2 - Skills/Concepts Application Problems

6. Determine the equation of the line presented in this graph. Express your answer in standard form, slope-intercept form and point-slope form.
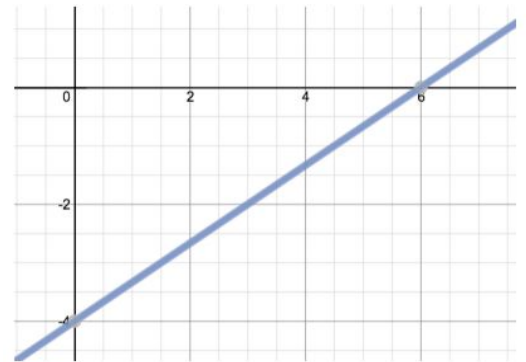
7. A function, $f(x)$, is defined by $f(x) = 5x + 12$.

a. Evaluate (i) $f(2)$ (ii) $f(-3)$ (iii) $f(-\frac{1}{5})$ (iv) $f(a)$

8. State the domain and range of the following graphs. Use MUST use set notation (for practice!!) and may use interval notation.
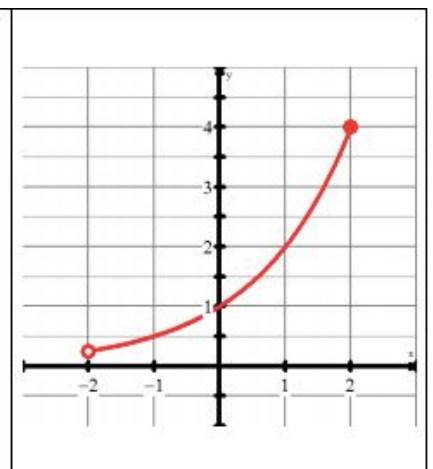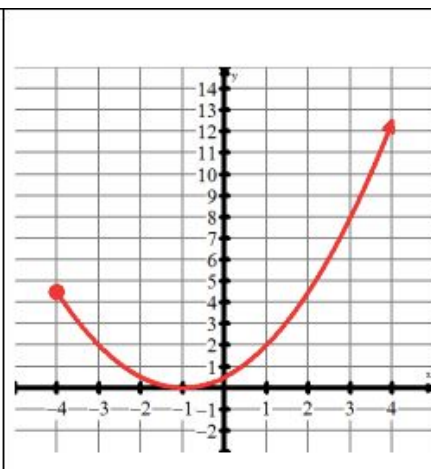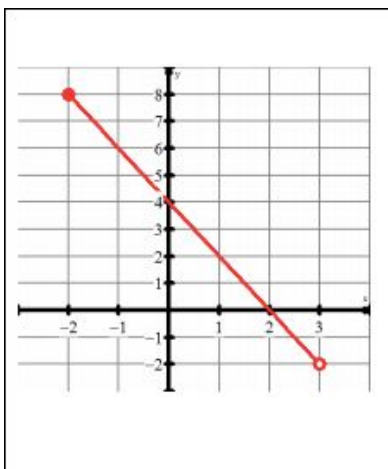
9. Barb is withdrawing $100 from her bank account. She asks for the money in $5 bills and $10 bills.

    a. If the teller gives her four $10 bills, how many $5 bills does she get?
    b. If the teller gives her eight $5 bills, how many $10 bills does she get?
    c. List 3 other combinations of $5 and $10 bills that Barb could get.
    d. State the domain and range of this relation.
    e. Determine an equation that can be used to model this situation.

Part 3 - Extension Problems

10. A function is defined as follows: $f(n + 1) = f(n) + 3$ where n is an integer greater than 0 and you are given that $f(1) = -2$. Evaluate $f(2)$ and $f(3)$ and $f(4)$ and $f(5)$.

HOMEWORK PROBLEMS:

(1) Function Notation: Nelson 11, Chap 1.2, p22, Q1,2,3
(2) Linear Relations: Nelson 10, Chap 1.1, p12, Q1,2,5