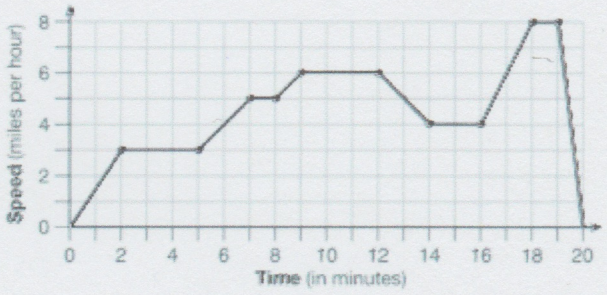
Key

Algebra 1 Chapter 5 Pre-Test

1.) (2.5 pts each, 10 pts total) (5-1) The graph below represents Arlene's speed during her 20-minute jog around her neighborhood. Use the graph to answer the following questions.



a) During which intervals was Arlene's speed increasing?

$t = 0 \to 2$ $\quad 16 \to 18$

$5 \to 7$

$8 \to 9$

b) During which intervals was Arlene's speed decreasing?

$t = 12 \to 14$

$19 \to 20$

c) During which intervals was Arlene's speed constant?

$t = 2 \to 5$ $\quad 14 \to 16$

$7 \to 8$ $\quad 18 \to 19$

$9 \to 12$

d) What time(s) did Arlene stop?

only at $t = 20$

2.) (5 pts total) (5-2) Find the domain and range of each relation.

a) {(-2,7), (-1,4), (0,9), (3,2)}

Domain: $\{-2, -1, 0, 3\}$ Range: $\{7, 4, 9, 2\}$

3.) (5 pts each, 10 pts total) (5-2) Determine whether each relation is a function.

a) {(-8,4), (-4,4), (-1,2), (7,2)}

yes different inputs can yield the same output.

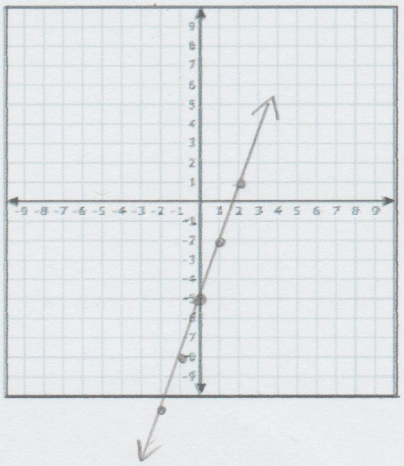
b) {(-6,3), (-5,-9), (-5,0), (-2,3)}

no, the same input (-5) delivered two different outputs (-9 and 0)

4.) (10 pts each, 20 pts total) (5-3) Use a table to graph each of the following functions.

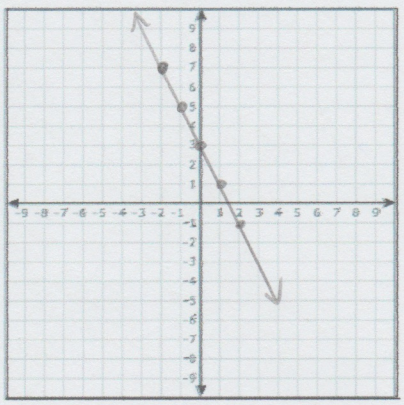
a) $y = 3x - 5$

x	y = 3x - 5	y
-2	$3(-2)-5=-6-5$	-11
-1	$3(-1)-5=-3-5$	-8
0	$3(0)-5$	-5
1	$3(1)-5=3-5$	-2
2	$3(2)-5=6-5$	1



b) $y = -2x + 3$

x	y = -2x + 3	y
-2	$-2(-2)+3=4+3$	7
-1	$-2(-1)+3$ $2+3$	5
0	$-2(0)+3$	3
1	$-2(1)+3$ $-2+3$	1
2	$-2(2)+3$ $-4+3$	-1



5.) (5 pts each, 15 pts total) (5-4) Analyze table and write the function rule.

x	f(x)
1	4
3	6
7	10
8	11

+3 +3 +3 +3

$f(x) = x + 3$

or

$y = x + 3$

x x + 3

x	f(x)
0	0
2	7
4	14
10	35

*$\frac{7}{2}$ *$\frac{7}{2}$ *$\frac{7}{2}$

$\frac{7}{2} = \frac{2 * k}{2}$

$\frac{7}{2} = k$

$4 * \frac{7}{2} = \frac{28}{2} = 14$

$10 * \frac{7}{2} = \frac{70}{2} = 35$

$f(x) = \frac{7}{2}x$

or

$y = \frac{7}{2}x$

x $x * \frac{7}{2}$

x	f(x)
-4	10
-2	12
1	15
3	17

+14 +14 +14 +14

$f(x) = x + 14$

$y = x + 14$

x x + 14

6.) (5 pts each, 10 pts total) (5-5) For the data in the table, tell whether y varies directly with x. If it does, write an equation for direct variation.

x	f(x)
-3	9
0	0
2	14
8	20

k

*-3?

* 7?

Even though the line goes through the origin (0,0), it is not direct variation because it does not have a consistent constant of variation.

$y = kx$

$\frac{9}{-3} = \frac{-3k}{-3}$ $k = -3$ $\frac{14}{2} = \frac{2k}{2}$ $k = 7$

$-3 \neq 7$

x	f(x)
-2	4
0	0
3	-6
4	-8

Direct Variation

Goes through origin and exhibits consistent constant of variation. (-2)

$y = -2x$

$y = kx$

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

$\frac{-6}{3} = \frac{3k}{3}$ $-2 = k$

$\frac{-8}{4} = \frac{4k}{4}$ $-2 = k$

7.) (2.5 pts each, 5 pts total) (5-5) Is each of the following equations an example of direct variation? If so, find the constant of variation.

a) -3x + 4y = 0

yes

$-3x + 4y = 0$

$+3x \quad +3y$

$\frac{4y}{4} = \frac{3x}{4}$ $y = \frac{3}{4}x$

$k = \frac{3}{4}$

nothing here

b) y + 5 = 2x

no

$y + 5 = 2x$

$-5 \quad -5$

$y = 2x - 5$

y intercept not at 0

(0,0) not a point!

$0 = 2(0) - 5$

$0 \neq -5$

8.) (5 pts each, 10 pts total) (5-5) Each of the following ordered pairs are examples of direct variation. Find each missing value.

a) (3, 8) and (x, 20)

$y = kx$

$\frac{8}{3} = \frac{3k}{3}$ $\quad k = \frac{8}{3}$

$\frac{3}{8}(20) = \left(\frac{8}{3}x\right)\frac{3}{8}$ $\quad x = \frac{60 \div 4}{8 \div 4}$ $\quad \boxed{\frac{15}{2}}$

b) (4, y) and (12, -9)

$y = kx$

$\frac{-9}{12} = \frac{12k}{12}$

$k = \frac{-9}{12} = \frac{-3}{4}$

$y = -\frac{3}{4}x$

$y = \frac{-3}{4}(4)$

$\boxed{y = -3}$

9.) (5 pts each, 15 pts total) (5-6) Find the fifth, tenth, and hundredth terms of each sequence.

a) 6, 14, 22, 30,...

+8 +8 +8

difference = 8

$a_0 + d(n-1)$

$6 + 8(n-1)$

$a_0 = 6$

$d = 8$

$n = 5$ $\quad 6 + 8(5-1)$ $\quad 6 + 8(4)$ $\quad 6 + 32 = 38$

$n = 10$ $\quad 6 + 8(10-1)$ $\quad 6 + 8(9)$ $\quad 6 + 72$ $\quad 78$

$n = 100$ $\quad 6 + 8(100-1)$ $\quad 6 + 8(99)$ $\quad 6 + 792$ $\quad 798$

a_0

5th : 38

10th : 78

100th : 798

b) 12, 5, -2, -9,...

a_0 -7 -7 -7

$a_0 = 12$

$d = -7$

$12 + (-7)(n-1)$

$n = 5$ $\quad 12 + (-7)(5-1)$ $\quad 12 + (-7)(4)$ $\quad 12 + (-28)$ $\quad -16$

$n = 10$ $\quad 12 + (-7)(10-1)$ $\quad 12 + (-7)(9)$ $\quad 12 + (-63)$ $\quad -51$

$n = 100$ $\quad 12 + (-7)(100-1)$ $\quad 12 + (-7)(99)$ $\quad 12 + (-693)$ $\quad -681$

5th : -16

10th : -51

100th : -681

c) -18, -23, -28, -33

a_0 -5 -5 -5

$a_0 = -18$

$d = -5$

$-18 + (-5)(n-1)$

$n = 5$ $\quad -18 + (-5)(5-1)$ $\quad -18 + (-5)(4)$ $\quad -18 + (-20)$ $\quad -38$

$n = 10$ $\quad -18 + (-5)(10-1)$ $\quad -18 + (-5)(9)$ $\quad -18 + (-45)$ $\quad -63$

$n = 100$ $\quad -18 + (-5)(100-1)$ $\quad -18 + (-5)(99)$ $\quad -18 + (-495)$ $\quad -513$

5th : -38

10th : -63

100th : -513