Name _____ Per. _____ Date _____

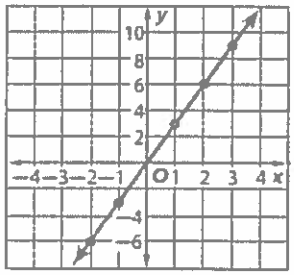
Quest Review

Direct Variation and Arithmetic Sequences

DIRECT VARIATION

Determine whether each of the following is a direct variation. Write yes or no. If yes, name the constant of variation. If no, explain what is preventing it from being a direct variation.

1.



yes,

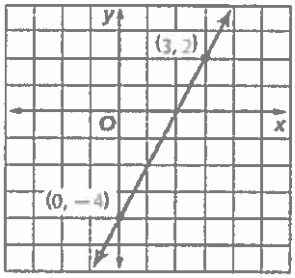
$\frac{3}{1} = 3 = k$

2. $y = -\frac{1}{2}x$

yes,

$k = -\frac{1}{2}$

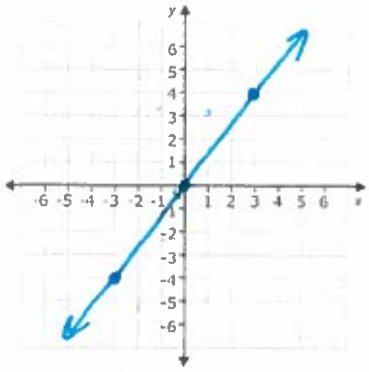
3.



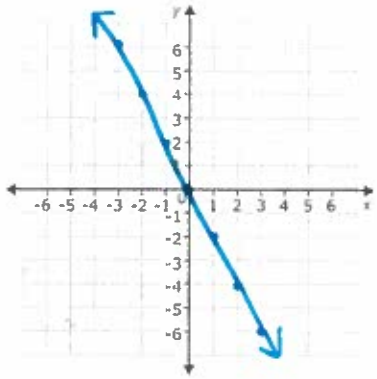
no, does not cross (0,0)

Graph the following direct variation.

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



5. $y = -2x$



Suppose y varies directly as x. Write a direct variation equation that relates x and y. Then solve for the given values.

6. If y = 15 when x = 2, find y when x = 4

$15 = k(2)$

$k = 7.5$

$y = 7.5x$

$y = 7.5(4)$

$y = 30$

7. If y = 4 when x = -4, find y when x = 7

$4 = k(-4)$

$-1 = k$

$y = -x$

$y = -1(7)$

$y = -7$

*For #5-6, be sure to **LABEL** your answers as needed.*

8. Suppose you earn $127 for working 20 hours. Write a direct variation equation relating your earnings to the number of hours worked. How much would you earn for working 35 hours?

$127 = k(20)$

$k = 6.35$

$y = 6.35x$

$y = 6.35(35)$

$y = \$222.25$

9. The amount of money raised by a charity carwash varies directly as the number of cars washed. When 11 cars are washed, $79.75 is raised. How many cars must be washed to raise $174?

$79.75 = k(11)$

$k = 7.25$

$y = 7.25x$

$174 = 7.25x$

$x = 24$ cars

ARITHMETIC SEQUENCES

1. Write the formula for an arithmetic sequence below, and use it as a reference throughout this section of the review.

$$a_n = a_1 + (n-1)d$$

For each sequence, name the common difference. Then find the next three terms.

2. 6, 11, 16, 21, ...

$d = 5$; 26, 31, 36

3. 1.4, 1.2, 1.0,...

$d = -.2$; 0.8, 0.6, 0.4

Write a function for the nth term of each arithmetic sequence.

4. $a_1 = 6$, $d = 5$

$a_n = 6 + (n-1)\cdot 5$

$f(n) = 6 + 5n - 5$

$f(n) = 1 + 5n$

5. 28, 25, 22, 19,...

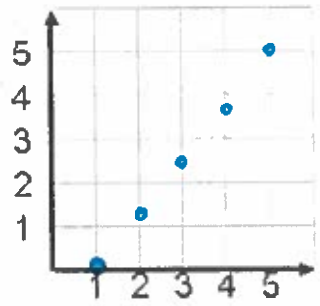
$f(n) = 28 + (n-1)(-3)$

$f(n) = 28 + -3n + 3$

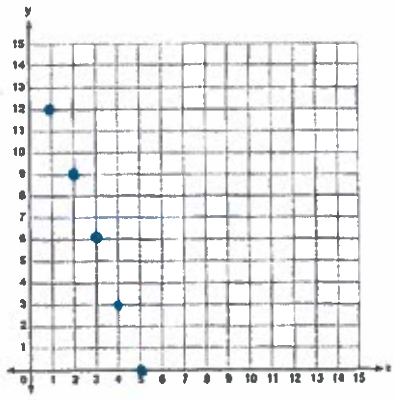
$f(n) = 31 - 3n$

Graph the first five terms of each of the following sequences.

6. 0, 1.25, 2.50, 3.75, ...



7. 12, 9, 6, 3, ...



8. The table shows the distance traveled by sound in water. Write an equation for this sequence. Then find the time for sound to travel 72,300 ft.

Time (s)	1	2	3	4
Distance (ft)	4820	9640	14,460	19,280

$f(n) = 4920 + (n-1)(4820)$

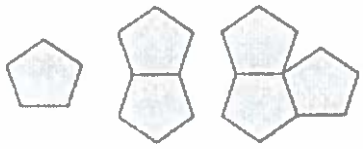
$= 4820 + 4820n - 4820$

$\boxed{f(n) = 4820n}$

$72,300 = 4820n$

$\boxed{n = 15}$

9. In each figure, only one side of each regular pentagon is shared with another pentagon. The length of each side is 1 centimeter. If the pattern continues, what is the perimeter of a figure that has 6 pentagons? (HINT: Start writing out the terms for the first three diagrams)



5 8 11

$f(n) = 5 + (n-1)(3)$

$f(n) = 5 + 3n - 3$

$\boxed{f(n) = 3n + 2}$