

**12.1**

Tell whether each is true or false. If true, tell which property is demonstrated.

$$(3y + 24) + 15 = 3y + (24 + 15)$$

$$16w - 16z = 16(w - z)$$

$$14n + 22p \times 0 = 0$$

$$(14n + 22p) \times \frac{1}{14n + 22p} = 1$$

**12.2**

Show the work for each of the following. Tell how the problems in each pair are alike.

$$\text{I) } \frac{7}{23} + \frac{11}{23} \qquad \frac{2a}{b+5} + \frac{a-2}{b+5}$$

$$\text{II) } \frac{3}{8} + \frac{3}{4} \qquad \frac{4x}{(x-1)(x+5)} + \frac{6}{x+5}$$

**12.3**

For the given pattern, determine the 40<sup>th</sup> entry.

$$1.2, 1.6, 2, 2.4, 2.8, 3.2, \dots$$

In an arithmetic sequence, each entry after the first is obtained by adding a fixed number to the previous entry. Fill in the blanks for this arithmetic sequence:

2.4, 3.1, 3.8, 4.5, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_; the 20<sup>th</sup> entry is: \_\_\_\_\_

Complete this sentence: In a geometric sequence, each entry after the first is obtained by

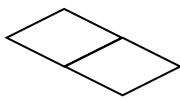
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Make up a geometric sequence that begins with the number 3 and list the next 5 entries:

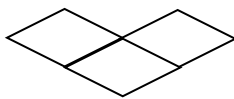
3, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

### 12.4

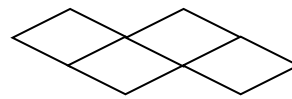
Find a function rule for the number of toothpicks to make Shape  $n$  in the following pattern:



Shape 1



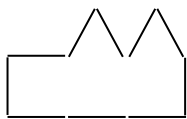
Shape 2



Shape 3

- A.  $3 + 4n$
- B.  $4 + 4n$
- C.  $4 + 3n$
- D.  $3 + 3n$
- E. None of the above

Find a function rule to determine the number of toothpicks to make Shape  $n$  in the pattern:



1



2



3

function pattern: \_\_\_\_\_

**12.5**

*In Jacob's CD collection, he has 6 more than twice the number in Frank's collection. Bob has five less than four times Frank's number. Together, Jacob and Frank have as many as Bob.*

Make and label a strip diagram to illustrate this situation.

Write an algebra equation to represent this situation.

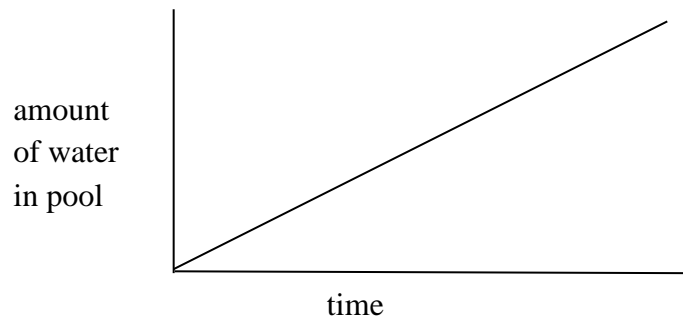
Solve to tell how many CDs each person has.

**13.1**

The graph shown represents the amount of water in a child's pool as time goes by if a small hose is turned on to maximum capacity.

Write a sentence describing how the two quantities are related.

On the same grid, draw a graph to show a new situation with the same pool, but a larger hose turned on to maximum capacity.



**13.2**

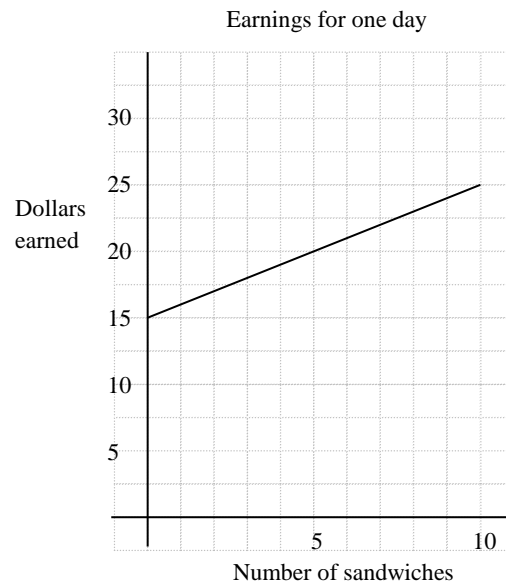
The graph shown represents the following situation: *Ashley delivers sandwiches for Jimmy John's. She is paid \$15 for a day's work and \$1 for every sandwich she delivers.*

Calculate the slope.

What does the slope mean in this situation?

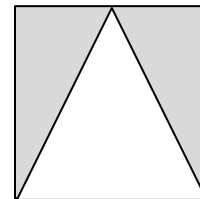
Should this graph be a smooth line or a series of dots? Explain.

If a new line on the same grid had the same slope but a different  $y$ -intercept, what would that mean?

**13.4**

Describe how the area of the shaded region below is related to the length of the side of the square.

Write an algebraic equation.



Does this describe a linear or nonlinear function? Explain.

**Lesson 8**

Find an equation of the parabola with  $x$ -intercepts at  $(2,0)$  and  $(8,0)$  that goes through the point  $(3,5)$ .

Write your equation in both forms:  $y = a(x - x_1)(x - x_2)$      $y = ax^2 + bx + c$

Find the vertex of this parabola.

**Lesson 9**

Make an  $x/y$  table using the  $x$ -values:  $-4, -3, -2, -1, 0, 1, 2, 3, 4$  for the following equations. Then draw the graph.

$$y = 3^x$$

$$y = \left(\frac{1}{4}\right)^x$$

If  $P$  dollars are deposited in an account earning interest at an annual rate  $r$ , compounded  $k$  times each year, the amount  $A$  in the account after  $t$  years is given by:

$$\text{Formula: } A = P \left(1 + \frac{r}{k}\right)^{kt}$$

Set up the equation needed to find the amount of money in the bank given these conditions:

\$8500 at 2% for  $w$  years compounded semi-annually

\$3000 at 1.5% for 5 years compounded monthly

**Lesson 10**

Show the algebra steps to find the inverse function for  $y = 5 - 2x$ .

Graph the original and the inverse function on the same set of axes.

Find:  $\log_{10} 0.1$

$$\log_6 \frac{1}{36}$$

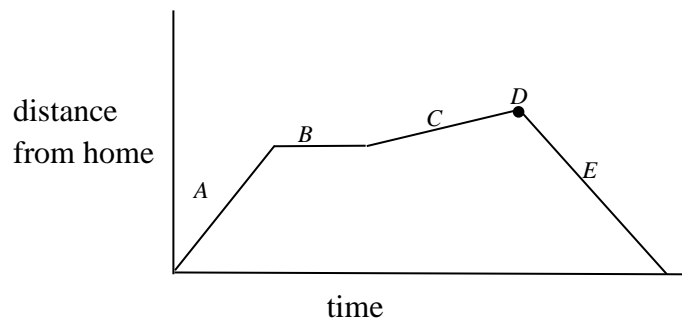
$$\log_a a^3$$

**14.1**

The graph shows distance from home as a function of time for Laura's trip to the mall.

Write a brief description of her trip that explains all features of the graph.

A.



B.

C.

D.

E.