12.1

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

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

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

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

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

12.2

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

I) $\dfrac{7}{23} + \dfrac{11}{23}$ $\dfrac{2a}{b+5} + \dfrac{a-2}{b+5}$

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

12.3

For the given pattern, determine the 40th entry.

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

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:

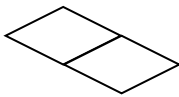2.4, 3.1, 3.8, 4.5, _____, _____, _____; the 20th entry is: _____

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

_____

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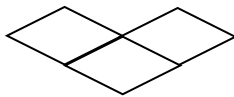
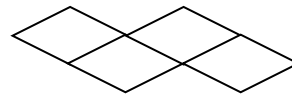3, _____ , _____ , _____ , _____ , _____

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.

amount
of water
in pool

time
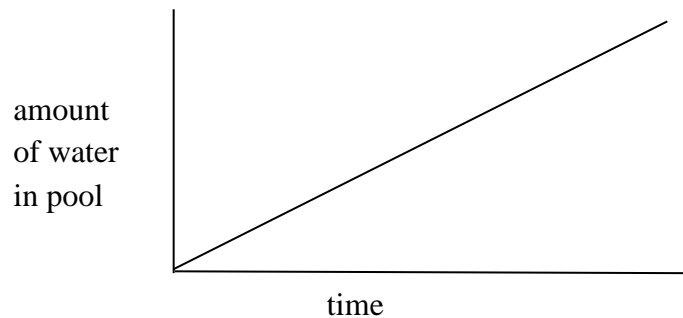
13.2

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?

Earnings for one day

Dollars earned

Number of sandwiches
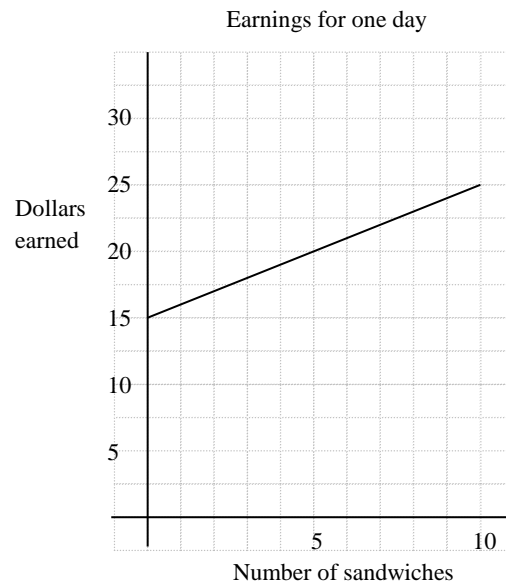
13.4

Describe how the area of the shaded region below is related to the length of the side of the square.
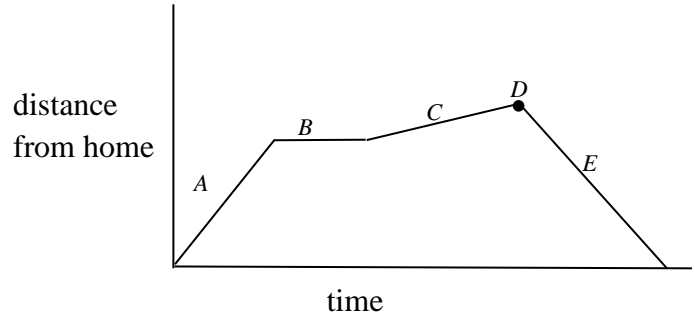
Write an algebraic equation.
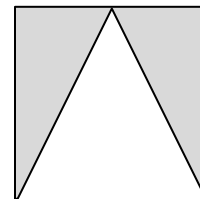
Does this describe a linear or nonlinear function? Explain.

14.1

The graph shows distance from home as a function of time for Laura's trip to the mall.
   Write a <u>brief</u> description of her trip that explains all features of the graph.

A.

B.

*C.*

D.

E.

14.3
 For this situation, make a distance-time graph and a speed-time graph. Align them so the
          corresponding pieces can be compared. (Assume cartoon-like changes in speed.)
Allison rode her bike at a leisurely pace until she got a flat. She stopped to fix the flat and it took her twice as long as the amount of time she had spent riding. When she resumed riding, she rode at her fastest speed to get to her friend's house in time to watch American Idol.

Total
distance
from home

time

speed

time

5
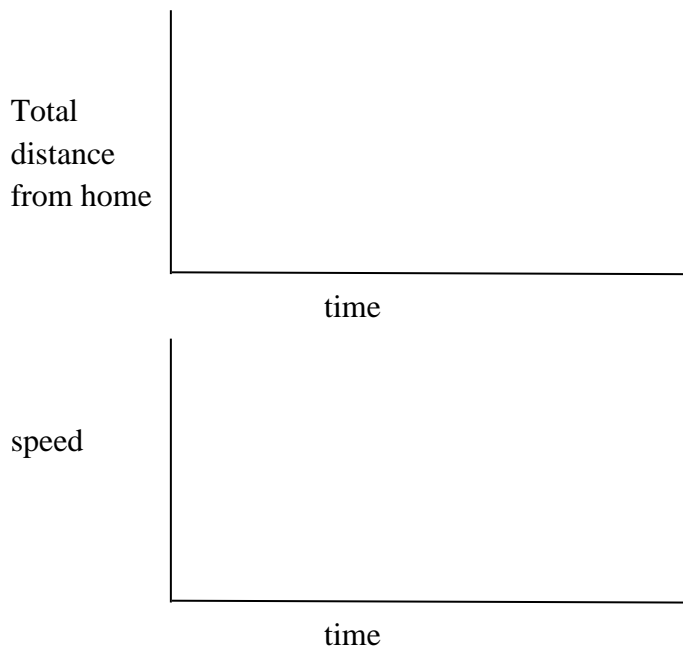
14.4

 Determine whether each statement is true or false, based on the information shown in the graph.
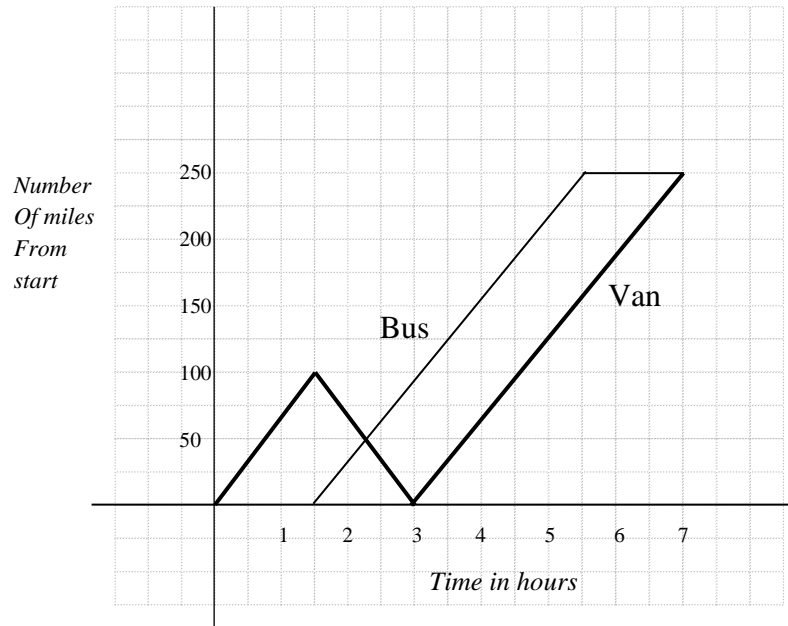
a) The bus waited two hours for the van to arrive.   **True**   **false**

b) The van turned around after 1.5 hours and went back
      to where it started.   **True**   **false**

c) The van traveled faster than the bus.   **True**   **false**

d) The bus traveled at a rate of 60 mph.   **True**   **false**

e) The van traveled a total of 450 miles.   **True**   **false**