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

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

12.3

For the given pattern, determine the 40^{th} entry.

1.2, 1.6, 2, 2.4, 2.8, 3.2, . . .

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^{th} entry is: _____

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

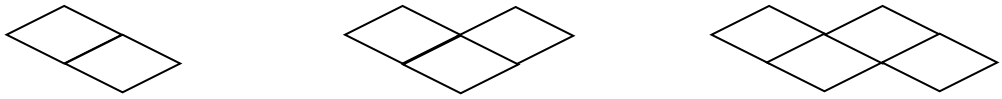
_____

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.

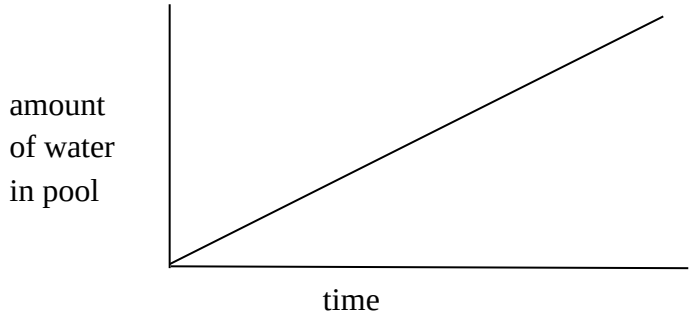
Make and label a strip diagram to illustrate this situation.

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.



13.2

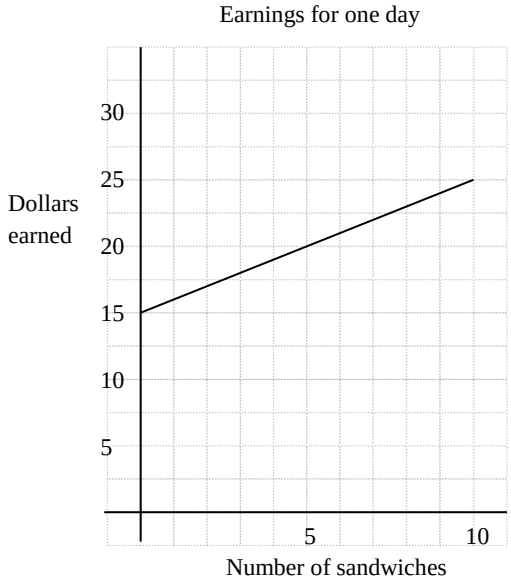
The graph shown represents the following situation: *Ashley delivers sandwiches for Jimmy John's. She is paid $15 for a day's work and $1 for every sandwich she delivers.*

Calculate the slope.

What does the slope mean in this situation?

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

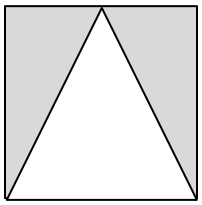
If a new line on the same grid had the same slope but a different *y*-intercept, what would that mean?



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:

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: $\log_{10} 0.1$ $\log_6 \frac{1}{36}$ $\log_a a^3$