UNIT 1/REAL NUMBERS

real rumbers
$\mathbb{R}$
any number that is not imaginary

natural numbers
$\mathbb{N}$
$1, 2, 3, 4, 5, \dots$

whole numbers
$\mathbb{W}$
$0, 1, 2, 3, 4, 5, \dots$

integers
$\mathbb{Z}$
$\dots -5, -4, -3, -2, -1, 0, 1, 2, 3, 4, 5, \dots$

numerator
the part of the fraction that is above the line

denominator
the part of the fraction that is below the line

rational numbers
$\mathbb{Q}$
a fraction or a decimal that terminates or repeats

1.2/UNDERSTAND IRRATIONAL NUMBERS

irrational numbers
$\mathbb{P}$ or $\mathbb{R} - \mathbb{Q}$
numbers that do not terminate or repeat
$\sqrt{3}$ and π

pi
π; represents the approximate number 3.1415…

radical
$\sqrt{}$; a symbol used to show square or n^{th} roots

radicand
$\sqrt{x}$; the term underneath or inside of the radical sign

square root
a number which produces a certain quantity when multiplied by itself

perfect square
a number that is the square of an integer

$\sqrt{1} = 1$	$\sqrt{4} = 2$	$\sqrt{9} = 3$	$\sqrt{16} = 4$	$\sqrt{25} = 5$	$\sqrt{36} = 6$
$\sqrt{49} = 7$	$\sqrt{64} = 8$	$\sqrt{81} = 9$	$\sqrt{100} = 10$	$\sqrt{121} = 11$	$\sqrt{144} = 12$
$\sqrt{169} = 13$	$\sqrt{225} = 15$	$\sqrt{400} = 20$	$\sqrt{900} = 30$	$\sqrt{1600} = 40$	$\sqrt{2500} = 50$

1.4/EVALUATE SQUARE ROOTS AND CUBE ROOTS

index
$\sqrt[n]{}$; the number on the outside of the radical; indicates the root of the radicand

cube root
a number which produces a certain quantity when multiplied by itself three times

perfect square
a number that is the cube of an integer

cube (action)
multiplying three of the same number, ex. $2 \times 2 \times 2$

cube (shape)
a three-dimensional object in which all six sides are made of squares

perfect cube
a number that is the cube of an integer

$\sqrt[3]{1} = 1$ $\qquad$ $\sqrt[3]{8} = 2$ $\qquad$ $\sqrt[3]{27} = 3$ $\qquad$ $\sqrt[3]{64} = 4$ $\qquad$ $\sqrt[3]{125} = 5$ $\qquad$ $\sqrt[3]{216} = 6$
$\sqrt[3]{1000} = 10$
$\sqrt[3]{-1} = -1$ $\qquad$ $\sqrt[3]{-8} = -2$ $\qquad$ $\sqrt[3]{-27} = -3$ $\qquad$ $\sqrt[3]{-64} = -4$ $\qquad$ $\sqrt[3]{-125} = -5$ $\qquad$ $\sqrt[3]{-216} = -6$
$\sqrt[3]{-1000} = -10$

1.6/USE PROPERTIES OF INTEGER EXPONENTS

Know all squares up to $13,$ *as well as* $15, 20, 30, 40,$ *and* 50
$1^3 = 3$ $\qquad$ $2^3 = 8$ $\qquad$ $3^3 = 27$ $\qquad$ $4^3 = 64$ $\qquad$ $5^3 = 125$ $\qquad$ $6^3 = 216$
$10^3 = 1000$
$1^4 = 1$ $\qquad$ $2^4 = 16$ $\qquad$ $3^4 = 81$ $\qquad$ $4^4 = 256$ $\qquad$ $5^4 = 625$
$1^5 = 1$ $\qquad$ $2^5 = 32$
$1^6 = 1$ $\qquad$ $2^6 = 64$

power
x^y
a number expressed using exponents

base
the number that is multiplied when using an exponent

exponent
in a power, indicates the number of times a number is to be multiplied

multiplication property of exponents
when multiplying two like bases, add their exponents

raising an exponent by an exponent
when multiplying two like bases, add their exponents

division property of exponents
when multiplying two like bases, add their exponents

1.9/USE PROPERTIES OF INTEGER EXPONENTS

scientific notation

a method used to simplify very large or very small numbers

UNIT 2/REAL NUMBERS

2.1/COMBINE LIKE TERMS TO SOLVE EQUATIONS

equation

a mathematical sentence that includes an equals sign

term

a number, a variable, or the product of a number and variable in an expression

coefficient

the number attached to the variable through multiplication or division

variable

a letter that takes the place of a number in an expression or equation

constant

a term that has no variable

like terms

terms that have the same variables

2.3/SOLVE MULTISTEP EQUATIONS

distributive property

$$a(b + c) = ab + ac$$

2.5/COMPARE PROPORTIONAL RELATIONSHIPS

coordinate plane

a grid that shows the relationship between two items

axis

a reference line

origin

the point where the x- and y-axes cross

ordered pair

(x, y)

2.6/CONNECT PROPORTIONAL RELATIONSHIPS AND SLOPE

rise

the change in the y-values

run

the change in the x-values

slope

rise over run; also known as the rate of change; in a direct variation it is the constant of variation

2.7/ANALYZE LINEAR EQUATIONS: $y = mx$

linear equation

an equation whose graph is a line

constant of variation (proportionality)

the constant rate of change in a direct variation equation

2.8/UNDERSTAND THE Y-INTERCEPT OF A LINE

y-intercept

the value of y when $x = 0$

2.9/ANALYZE LINEAR EQUATIONS: $y = mx + b$

slope-intercept form

$y = mx + b$

a form of a linear equation that provides the slope and y-intercept of the graphed line

quadrant

on a coordinate plane, the four regions of the plane created by x- and y-axes

UNIT 3/USE FUNCTIONS TO MODEL RELATIONSHIPS

3.1/UNDERSTAND RELATIONS AND FUNCTIONS

relation

any ordered pair or combination of ordered pairs

function

a relation for which each value of x only has one associated value of y

domain

all of the *x*-values included in a graph, table, or list of ordered pairs

range

all of the *y*-values included in a graph, table, or list of ordered pairs

vertical line test

a trial used on a graph to determine if a relation is a function

3.2/CONNECT REPRESENTATIONS OF FUNCTIONS

initial value

the y-intercept of a Quadrant I function

rate of change

slope; represents how quickly one variable changes in relation to another

linear function

the graph of a straight line

nonlinear function

a graph that is not a perfectly straight line

3.5/INTERVALS OF INCREASE AND DECREASE

qualitative graph

represents the relationship between quantities without numbers

interval

a period of time between two events or points in time

UNIT 4/USE FUNCTIONS TO MODEL RELATIONSHIPS

4.1/CONSTRUCT AND INTERPRET SCATTER PLOTS

scatter plot
a graph that shows the relationship between two sets of data

positive association
y-values tend to increase as x-values increase

negative association
y-values tend to decrease as x-values increase

cluster
a group of points that lie close together

gap
an area in a graph that contains no data

outlier
a data point that is set off from the other data points

4.2/ANALYZE LINEAR ASSOCIATIONS

trend line
a line that passes through the middle of the plotted points

weak association
some or most points are far from the trend line

strong association
some or most points are close to the trend line

4.4/INTERPRET TWO-WAY FREQUENCY TABLES

categorical data
data that falls into categories

4.5/INTERPRET TWO-WAY RELATIVE FREQUENCY TABLES

relative frequency table
shows the ratio of the number of data in each category to the total number of data items