
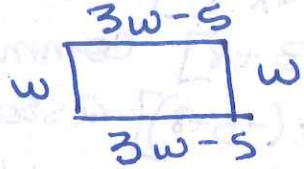


Unit 1 Learning Goals Check List:

Key

Section	Learning Goal	✓
1.1	<p>a) I can write algebraic expressions from verbal descriptions</p> <p>Ex. The length of my car is 3 feet less than twice its width</p>  <p>Ex. Write an algebraic expression for the perimeter of a rectangle, whose length is 5 less than 3 times its width.</p>  <p>$P = 8w - 10$</p> <p>b) I can write verbal descriptions from algebraic expressions.</p> <p>Ex. Write a verbal expression that could generate the algebraic expression $3(x + 10) - 4$.</p> <p>3 times the sum of x and 10 reduced by 4.</p>	
1.2	<p>a) I can evaluate algebraic expressions using correct order of operations</p> <p>Ex. $3 + 42 \div 2 - 5$</p> <p>$3 + 84 - 5$ $= 87 - 5$ $= 82$</p> <p>ex. $25 + \left[(16 - 3 \cdot 5) + \frac{12 + 3}{5} \right]$</p> <p>$25 + \left[(16 - 15) + \frac{15}{5} \right]$ $= 25 + [1 + 3]$ $= 25 + 4$ $= 29$</p> <p>b) I can evaluate algebraic expressions by substituting given values for variables.</p> <p>Evaluate each expression if $a = -2$; $b = -4$; and $c = -6$</p> <p>ex. $\frac{3ab - c^2}{a} = \frac{3(-2)(-4) - (-6)^2}{-2}$</p> <p>$= \frac{24 - 36}{-2} = \frac{-12}{-2} = 6$</p> <p>ex. $2a + 4b - c = 2(-2) + 4(-4) - (-6)$</p> <p>$= -4 - 16 + 6$ $= -20 + 6$ $= -14$</p>	

1.3/1.4 a) I can simplify algebraic expressions and name the property used.

ex. $7(a^2 + b) + 2a^2 - 4(a - b)$
 $7a^2 + 7b + 2a^2 - 4a + 4b$
 $7a^2 + 2a^2 + 7b + 4b - 4a$
 $(7a^2 + 2a^2) + (7b + 4b) - 4a$
 $9a^2 + 11b - 4a$

Distributive
Commutative prop. of add.
associative prop. of add.
Substitution

ex. $3\left[\frac{1}{2}(4x - 6) - 2(3x - 4)\right] \rightarrow 3[2x - 3 - 6x + 8]$ distributive property
 $3[2x - 6x - 3 + 8]$ commutative
 $3[(2x - 6x) + (-3 + 8)]$ associative
 $3(-4x + 5)$ substitution
 $-12x + 15$ distributive

1.5 a) I can solve equations and write my answers as a solution set.

ex. find the solution to the equation $2q + 5 = 13$ if the replacement set is $\{2, 3, 4, 5, 6\}$.

$2q + 5 = 13$
 $-5 -5$
 $2q = 8$
 $q = 4$
 Solution set $\{4\}$

b) I can solve equations and recognize contradictions (no solution) and identities (solution = all real numbers).

ex. $12(10 - 7) + 9g = g(2^2 + 5) + 36$

$12(3) + 9g = g(9) + 36$
 $36 + 9g = 9g + 36$

$36 + 9g = 9g + 36$
 $-9g -9g$
 $36 = 36$ ✓

Infinite Solutions

ex. $2d + (2^3 - 5) = 10(5 - 2) + d(12 \div 6)$

$2d + (8 - 5) = 10(3) + d(2)$

$2d + 3 = 30 + 2d$
 $-2d -2d$
 $3 \neq 30$

no solution!

1.6 I can identify domain & range; independent & dependent variables.

ex. Find the values in the range of $g(x) = 2x - 7$ for the domain values $\{-1, 0, 1\}$

x	2x-7	y
-1	2(-1)-7	-9
0	2(0)-7	-7
1	2(1)-7	-5

Range = $\{-9, -7, -5\}$

Ex. When your little brother stops up the drain, the plumber charges your mom \$90 for a service call, plus \$45 for each hour that he is working to repair the problem. Write & evaluate an equation to find how much the bill was if it took the plumber 3 hours to fix the drain. Identify the independent & dependent variables.

Cost = $90 + 45h$

Cost = $90 + 45(3)$
 $= 90 + 135$
 $= \$225$

$h = \# \text{ hours}$

ex. Your 30 gallon aquarium has sprung a leak and you want to fix it with underwater sealer, but you have to go to the store and find it. The water is draining at approximately two gallons per hour. Write an equation to model the amount of water remaining as a function of time, with w being water level and h being number of hours that the tank has been leaking. Identify the independent and dependent variables and a **reasonable domain & range**. Evaluate how much water is left in the aquarium if it took you 3 hours to find the sealant.

Water Level = $30 - 2h$ Domain = # hours leaking

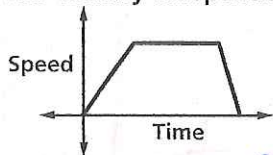
$w = 30 - 2h$

Range = water level

Domain: $[0, 15]$ Range: $[0, 30]$

I can identify independent & dependent variables from graphs and describe what is happening.

Ex. Identify independent & dependent variables and write a description from the graph.



Independent Variable = time
Dependent variable = speed

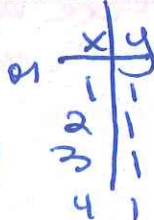
A car speeds up from park. Travels at a constant speed until reaching its destination, then slows and stops.

1.7 I can identify functions from multiple representations.

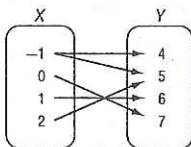
Ex. determine if each example represents a function. State why or why not.

a. $\{(1,1), (2,1), (3,1), (4,1)\}$

yes! no x values repeat

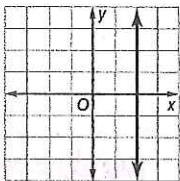


b.



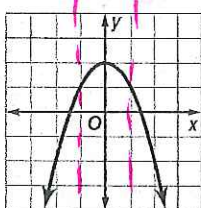
no! -1 is paired with both 4 & 5
 $(-1,4) (-1,5)$

c.



no! vertical line fails vertical line test.

d.



yes! passes vertical line test

I can identify function values.

Ex. $f(x) = 3x - 5$ and $g(x) = 2 - x^2$

$g(-1) = 2 - (-1)^2 = 2 - 1 = 1$
 $g(-1) = 1$

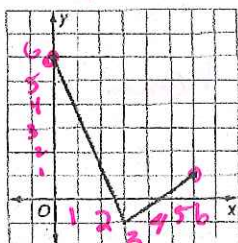
$f(6) - g(4) =$
 $f(6) = 3(6) - 5 = 18 - 5 = 13$
 $g(4) = 2 - (4)^2 = 2 - 16 = -14$

$f(6) - g(4) = 13 - (-14) = 13 + 14 = 27$

$f(x) = 31$
 $y = 31$
 $31 = 3x - 5$
 $+5$
 $36 = 3x$

$x = 12$

I can identify domain & range from a graph.



$D: [0, 6]$

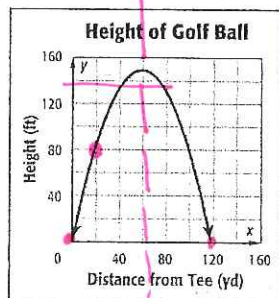
or $0 \leq x \leq 6$

$R: [-1, 6]$

or $-1 \leq y \leq 6$

1.8

I can interpret graphs of functions, including identifying x & y intercepts.
relative extrema, increasing and decreasing intervals, & ending behavior



Linear/non-linear?

non-linear

X intercepts: 0 & 120
meaning: ball traveled 120 yds from tee box
Symmetry: yes

Y intercept: 0
meaning: ball started on the ground

Relative extrema: (60, 140)

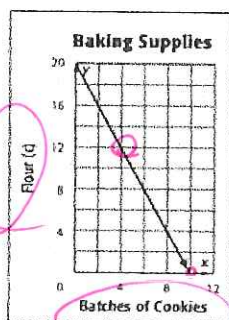
meaning: ball reached maximum height of 140 ft 60 yd from tee box

Increasing & decreasing intervals and their meaning.

Incsg (0, 60) Decsg (60, 120)

What does the point (20, 80) represent on the graph?

Ball is 80 ft high when it is 20 yds. from tee box



Linear/non-linear?

X intercept: (10, 0)

Meaning: no flour left after 10 batches of cookies

Y intercept: (0, 20)

meaning: 20 cups of flour before baking any cookies

Symmetry: no

Relative extrema: none

Increasing & decreasing intervals and their meaning.

Decsg (0, 10)

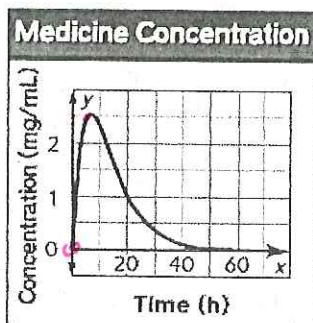
Reasonable domain & range:

D: [0, 10]

R: [0, 20]

What does the point (4, 12) represent on the graph?

12 cups of flour left after 4 batches of cookies are baked.



linear/non-linear

non-linear

X intercept: (0, 0)

Meaning: concentration of medication b/f administered

Y intercept: (0, 0)

meaning: 2

Relative extrema: (8, 2.5)

meaning:

at 8 hours, medicine concentration has peaked at 2.5 mg/mL.

Symmetry: none

50 problems - 2 points each