ANSWER KEY

SAMPLE SKILL QUIZ 1

1. Consider the following seven mathematical statements:

A. $3x^2 + 5 = 2x$

B. $\frac{6}{x^2} + 1 = \frac{-5}{x}$

C. $3 - x^5 = 35$

D. $\sqrt[2]{3 - 2x} + 5$

E. $23 - 3|x - 5| = 5$

F. $\sqrt[2]{x + 7} + 1 = 2x$

G. $4x - 3 = 21 - 4x$

Please match the given algebraic statements with the proper names for these statements below. Also, please write a short description under each of your choices to explain your reasoning why you made the choice you did.

Linear equation G

Each side of a linear equation has a line:

Left-hand side: $y_1 = m \cdot x + b$
Right-hand side: $y_2 = m \cdot x + b$

We are trying to find where the lines meet.
In other words, we're looking for the input value(s) of variables of x where the outputs on the left and right hand side are equal

Radical equation F

An equation that includes a radical symbol on at least one side of the equals sign. Radical symbols take the form $\sqrt[n]{\quad}$

Absolute value equation E

An equation that includes the absolute value bars

$| \cdot |$

on at least one side of the equals sign.

Quadratic equation A

Recall that the word *cuadro* means square in Spanish. This is a good way to remember that quadratic equations include a square x^2 term on at least one side of the equals side.

Rational equation B

An equation that includes a fraction on at least one side of the equals sign. This fraction should have a variable in the denominator

Power equation C

Recall: a power expression has a variable base and a constant power in the form x^n

Algebraic expression D

An algebraic expression does not have an equals sign.

2. Use any algebraic technique (and show your work) to solve the equation:

$$x - 6 = 3 \cdot (2 - x)$$

$\Rightarrow \quad x - 6 = 6 - 3x$

$+3x \qquad\qquad +3x$

$\Rightarrow \quad 4x - 6 = 6$

$+6 \qquad\quad +6$

$\Rightarrow \quad \frac{4x}{4} = \frac{12}{4} \quad \Rightarrow \quad \boxed{x = 3}$

3. Use any algebraic technique (and show your work) to solve the equation:

$$5 - x = \frac{2x - 5}{3}$$

$\Rightarrow \quad \frac{3}{1} \cdot \frac{(2x - 5)}{3} = 3(5 - x)$

$\Rightarrow \quad 2x - 5 = 15 - 3x$

$+3x \qquad\qquad +3x$

$\Rightarrow \quad 5x - 5 = 15$

$+5 \qquad\quad +5$

$\Rightarrow \quad \frac{5x}{5} = \frac{20}{5} \quad \Rightarrow \quad \boxed{x = 4}$

2. Use a graphical technique to solve the equation:

$$x - 6 = 3 \cdot (2 - x).$$

Make sure to demonstrate all five steps of this process. You are welcome to use your calculator.

Step 1: Identify and graph the function on the left-hand side of the equals sign.

Step 2: Identify the function on the right-hand side of the equals sign and graph this function on the same axis you used in step 1.

Step 3: Find the point(s) of intersection between the graphs of the two functions.

Step 4: Write each point of intersection as an ordered pair in the form (x, y).

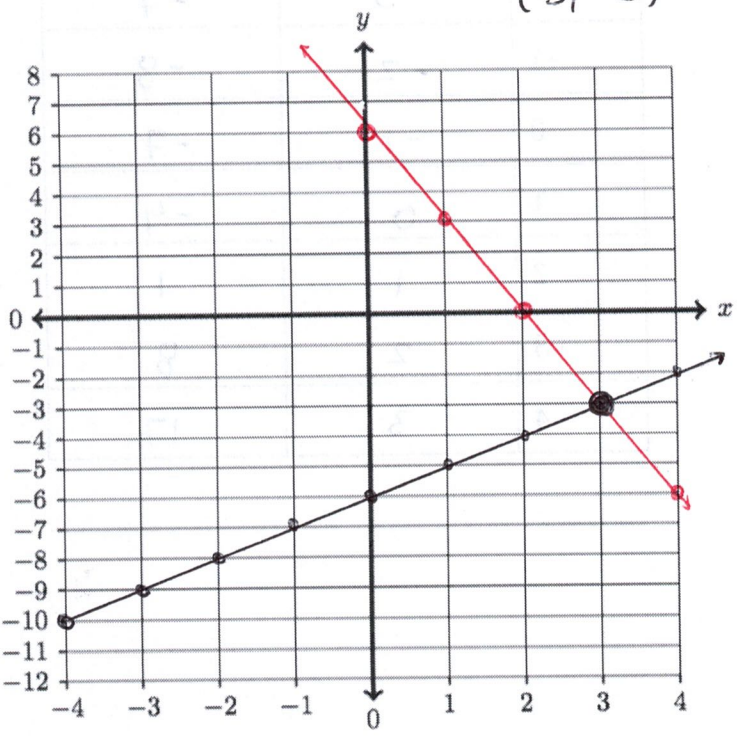
Step 5: Set the variable from the equation equal to the 1st coordinate of each point of intersection. Your final solution should be in the form variable = number

Please specifically identify each point of intersection on your graph. Also, please write each of these points as an ordered pair with an x-coordinate and y-coordinate. Use this information to find a solution to this algebraic equation.

	LHS of Equals Sign	*RHS of Equals Sign*
x	$y_1 = 6 - x$	$y_2 = 6 - 3x$
−4	−10	18
−3	−9	15
−2	−8	12
−1	−7	9
0	−6	6
1	−5	3
2	−4	0
3	−3	−3
4	−2	−6

Point of Intersection

(3, −3)



Solution $\boxed{x = 3}$

Use a graphical technique to solve the equation:

$$x - 1 = x^2 + 2x - 7.$$

Make sure to demonstrate all five steps of this process (you are welcome to use your calculator).

Please specifically identify each point of intersection on your graph.

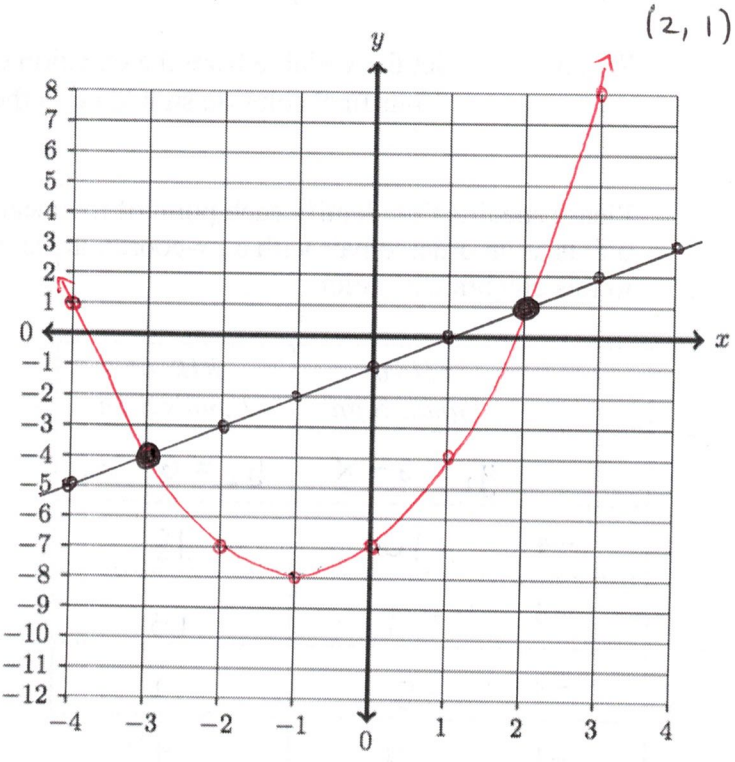
Please write each of these points as an ordered pair with an x-coordinate and y-coordinate.

Use this information to find a solution to this algebraic equation.

	LHS of Equals Sign	*RHS of Equals Sign*
x	$y_1 = x - 1$	$y_2 = x^2 + 2x - 7$
−4	−5	1
−3	−4	−4
−2	−3	−7
−1	−2	−8
0	−1	−7
1	0	−4
2	1	1
3	2	8
4	3	17

Left Point of Intersection
(−3, −4)

Right Point of Intersection
(2, 1)



Solutions

$x = -3$ or $x = 2$