## ALGEBRA I ASSESSMENT ANALYSIS – SOL ALIGNMENT AND COGNITIVE DEMAND

### STANDARD A.4

**The student will solve multistep linear and quadratic equations in two variables, including**

- **a) solving literal equations (formulas) for a given variable;**
- **b) justifying steps used in simplifying expressions and solving equations, using field properties and axioms of equality that are valid for the set of real numbers and its subsets;**
- c) solving quadratic equations algebraically and graphically;
- **d) solving multistep linear equations algebraically and graphically;**
- e) solving systems of two linear equations in two variables algebraically and graphically; and
- f) solving real-world problems involving equations and systems of equations.

**Graphing calculators will be used both as a primary tool in solving problems and to verify algebraic solutions.**

---

1. Determine the value of x that makes this equation true. $\frac{x-7}{3} = 4$

   a) x = 8
   b) x = 0
   c) x = 19
   d) x = 14

2. Select all of the following expressions that correctly illustrate the Associative Property of Addition?

| | |
|---|---|
| a) $2x + 8 - 5x = 9$<br>$2x - 5x + 8 = 9$ | b) $(8 + 2x) - 5x = 9$<br>$8 + (2x - 5x) = 9$ |
| c) $8x + (2x - 5x) = 9$<br>$(8x + 2x) - 5x = 9$ | d) $(8 + 2x) - 5x = 9$<br>$(2x + 8) - 5x = 9$ |

3. Solve the following equation for m: y = mx + b.

_____

4. What is the solution to $3x + 5 - 7 = 2x + 8$ ?
   a) x = -2
   b) x = 2
   c) x = 6
   d) x = 10

5. What is the solution to $3\frac{1}{4}x = 5$ ?
   a) $x = \frac{13}{20}$
   b) $x = \frac{20}{13}$
   c) $x = \frac{15}{4}$
   d) $x = \frac{20}{3}$

6. Select all of the following that will illustrate the solution to 2x – 4 = 4 (x + 3)

| | |
|---|---|
| a) Graph of $Y_1 = 2x - 4$<br>$Y_2 = 4(x+3)$ | b) Graph of $Y_1 = 2x + 4$<br>$Y_2 = 4(x - 3)$ |
| c) Graph of $Y_1 = 2x - 4$<br>$Y_2 = -4(x+3)$ | d) Graph of $Y_1 = 2x - 4 - [4(x+3)]$<br>$Y_2 = 0$ |

7. Identify the property that justifies the work between step 6 and step 7.

Step 1: $8\,(x-1) = -4 + 2\,(3x + 1)$

Step 2: $8x - 8 = -4 + 6x + 2$

Step 3: $8x - 8 = -4 + 2 + 6x$

Step 4: $8x - 8 = -2 + 6x$

Step 5: $8x - 8 - 6x = -2 + 6x - 6x$

Step 6: $2x - 8 = -2$

Step 7: $2x - 8 + 8 = -2 + 8$

Step 8: $2x = 6$

Step 9: $(2x)/2 = 6/2$

Step 10: $x = 3$

| | |
|---|---|
| Distributive Property | Identity Property of Addition |
| Commutative Property of Addition | Addition Property of Equality |
| Associative Property of Addition | Inverse Property of Addition |

8. Solve the following equation: $\frac{3}{4}(x+2) - 5 = 2\left(x - \frac{3}{8}\right)$

a) $x = \frac{-7}{4}$

b) $x = \frac{-21}{10}$

c) $x = \frac{-11}{5}$

d) $x = \frac{-9}{5}$