

Name Key

Math 8

Date _____ Period _____

Equation Solving Practice Test

I. Multiple Choice: Circle the correct answer for each question.

1. Which of the following is
- not
- a possible first step to solve the following equation?

$$\frac{1}{4}(x + 12) - 3 = 5x + 10$$

- (a) Subtract twelve from both sides
 (b) Add three to both sides
 (c) Multiply both sides of the equation by 4
 (d) Subtract ten from both sides

2. What value could be placed in for
- h
- that would make the following equation infinite solutions?

$$5x + 15 = 5(x + h)$$

- (a) 15
 (b) -3
 (c) 1
 (d) 3

3. What is the solution to the following equation?

$$8(x - 9) + 1 = 8x - 8$$

- (a) Infinite solutions
 (b) No solution
 (c) $x = 0$
 (d) $x = 1$

$$\begin{array}{r} 8x - 72 + 1 = 8x - 8 \\ 8x - 71 = 8x - 8 \\ \underline{-8x \quad -8x} \\ -71 \neq -8 \end{array}$$

4. If
- $x = -3$
- , what is the correct substitution for the expression
- $x^2 - x$
- ?

- (a) $-3^2 - (-3)$
 (b) $-(-3)^2 - (-3)$
 (c) $(-3^2) - 3$
 (d) $(-3)^2 - (-3)$

$$(-3)^2 - (-3)$$

5. Which of the following is
- not
- equivalent to
- $d = rt$
- ?

- (a) $r = dt$
 (b) $t = \frac{d}{r}$
 (c) $r = \frac{d}{t}$
 (d) $1 = \frac{rt}{d}$

$$\begin{array}{l} d = rt \\ \frac{d}{t} = \frac{rt}{t} \\ r = \frac{d}{t} \end{array}$$

Short Answer: Show work for each question.

6. Let
- $a = 5$
- ,
- $b = 3$
- ,
- $c = -2$
- , and
- $d = -4$
- . Substitute and simplify each.

$$\begin{array}{l} (bc)^2 - d \\ (3 \cdot -2)^2 - (-4) \\ (-6)^2 + 4 \\ 36 + 4 \\ \boxed{40} \end{array}$$

$$\begin{array}{l} \frac{c^2 + d^2}{a} \\ \frac{(-2)^2 + (-4)^2}{5} \\ \frac{4 + 16}{5} \\ \frac{20}{5} = \boxed{4} \end{array}$$

$$\begin{array}{l} -a^2 + bd \div ca \\ -5^2 + 3(-4) \div (-2)(3) \\ -25 + 3(-4) \div (-2)(5) \\ -25 - 12 \div (-2)(5) \\ -25 + 6(5) \\ -25 + 30 \\ \boxed{5} \end{array}$$

7. Use order of operations to simplify:

$$\begin{aligned} & 10 - 2[4 + 3(5 - 7)^2 + 6] \\ & 10 - 2[4 + 3(-2)^2 + 6] \\ & 10 - 2[4 + 3(4) + 6] \\ & 10 - 2[4 + 12 + 6] \\ & 10 - 2[22] \\ & 10 - 44 \\ & \boxed{-34} \end{aligned}$$

8. Use order of operations to simplify:

$$\begin{aligned} & (8+2)^2 - 8(4) \div (2)(5) \\ & (10)^2 - 8(4) \div (2)(5) \\ & 100 - 8(4) \div 2(5) \\ & 100 - 32 \div 2(5) \\ & 100 - 16(5) \\ & 100 - 80 \\ & \boxed{20} \end{aligned}$$

9. Solve by clearing fractions first. $\frac{2}{3}(x-5) + 8 = \frac{5}{6}x + 2(6)$

$$\begin{aligned} & 4(x-5) + 48 = 5x + 12 \\ & 4x - 20 + 48 = 5x + 12 \\ & 4x + 28 = 5x + 12 \\ & \begin{array}{r} 4x + 28 = 5x + 12 \\ -4x \qquad -4x \\ \hline 28 = x + 12 \\ -12 \qquad -12 \\ \hline 16 = x \end{array} \end{aligned}$$

10. Solve by clearing decimals first. $0.08 + x - 2.5 = [1.1x + 4](100)$

$$\begin{aligned} & 8 + 100x - 250 = 110x + 400 \\ & 100x - 242 = 110x + 400 \\ & \begin{array}{r} 100x - 242 = 110x + 400 \\ -100x \qquad -100x \\ \hline -242 = 10x + 400 \\ -400 \qquad -400 \\ \hline -642 = 10x \\ \frac{-642}{10} = \frac{10x}{10} \\ \boxed{-64.2 = x} \end{array} \end{aligned}$$

11. Solve each proportion.

$$\frac{10}{x-6} \neq \frac{8}{x+5}$$
$$10(x+5) = 8(x-6)$$
$$10x + 50 = 8x - 48$$
$$\begin{array}{r} -8x \\ \hline 2x + 50 = -48 \\ -50 \quad -50 \\ \hline 2x = -98 \\ \frac{2x}{2} = \frac{-98}{2} \\ \boxed{x = -49} \end{array}$$

$$\frac{x-7}{8} \neq \frac{x+4}{9}$$
$$9(x-7) = 8(x+4)$$
$$9x - 63 = 8x + 32$$
$$\begin{array}{r} -8x \\ \hline x - 63 = 32 \\ +63 \quad +63 \\ \hline \boxed{x = 95} \end{array}$$

12. Solve.

$$5x + 6 - x = 2(x+6) + 2x$$
$$4x + 6 = 2x + 12 + 2x$$
$$4x + 6 = 4x + 12$$
$$\begin{array}{r} -4x \quad -4x \\ \hline 6 \neq 12 \end{array}$$
$$\boxed{\text{No Solution}}$$

13. Solve.

$$-3.1x + 7 - 7.4x = 1.5x - 6(x - \frac{3}{2})$$
$$10(-3.1x + 7 - 7.4x) = (1.5x - 6x + 9)(10)$$
$$-31x + 70 - 74x = 15x - 60x + 90$$
$$\begin{array}{r} -105x + 70 = -45x + 90 \\ +105x \quad +105x \\ \hline 70 = 60x + 90 \\ -90 \quad -90 \\ \hline -20 = 60x \\ \frac{-20}{60} = \frac{60x}{60} \\ \boxed{-\frac{1}{3} = x} \end{array}$$

14. Solve.

$$10 - (x+6) - 4x = 3(x+4) - 8x - 8$$
$$10 - x - 6 - 4x = 3x + 12 - 8x - 8$$
$$4 - 5x = -5x + 4$$
$$\begin{array}{r} +5x \quad +5x \\ \hline 4 = 4 \end{array}$$
$$\boxed{\text{Infinite Solutions}}$$

15. Solve for a. $2\left(\frac{1}{2}abc\right) = 2(d)$

$$\frac{abc}{bc} = \frac{2d}{bc}$$

$$a = \frac{2d}{bc}$$

$$ab + c = d$$

$$\underline{-c \quad -c}$$

$$\frac{ab}{b} = \frac{d-c}{b}$$

$$a = \frac{d-c}{b}$$

$$2a + bc = 5a + d$$

$$\underline{-2a \quad -2a}$$

$$bc = 3a + d$$

$$\underline{-d \quad -d}$$

$$\frac{bc-d}{3} = \frac{3a}{3}$$

$$a = \frac{bc-d}{3}$$

16. Translate and solve. Twice the sum of a number and four is equivalent to a number increased by 12. Find the number.

Let $n =$ the number = 4

$$2(n+4) = n + 12$$

$$2n + 8 = n + 12$$

$$\underline{-n \quad -n}$$

$$n + 8 = 12$$

$$\underline{-8 \quad -8}$$

$$n = 4$$

17. Translate and solve. The product of a number and five is decreased by seven times the number and increased by ten, is the same as three times the difference of a number and four.

Let $n =$ the number = $\frac{22}{5}$ or $4\frac{2}{5}$ or 4.4

$$5n - 7n + 10 = 3(n - 4)$$

$$-2n + 10 = 3n - 12$$

$$\underline{+2n \quad +2n}$$

$$10 = 5n - 12$$

$$\underline{+12 \quad +12}$$

$$\frac{22}{5} = \frac{5n}{5}$$

$$4\frac{2}{5} \text{ or } 4.4 = n$$