

Name: _____

KEY

Period: _____

Study Guide: Linear Equations

1. In the equation shown, what is the value of x that makes the equation true? Show your work.

$$\frac{3}{4}(x+8) = 9$$

$$\frac{3}{4}x + 6 = 9$$

$$\frac{3}{4}x + 6 - 6 = 9 - 6$$

$$\frac{3}{4}x = 3$$

$$\frac{4}{3} \cdot \frac{3}{4}x = 3 \cdot \frac{4}{3}$$

$$x = 4$$

2. Determine whether the equation has no solution, one solution, or infinitely many solutions. Show your work.

$$-2(11 - 12x) = -4(1 - 6x)$$

$$-22 + 24x = -4 + 24x$$

$$-22 + 24x - 24x = -4 + 24x - 24x$$

$$-22 = -4$$

no solution

3. Solve for x . Show your work.

$$9(3 - 2x) = 2(10 - 8x)$$

$$27 - 18x = 20 - 16x$$

$$27 - 18x + 18x = 20 - 16x + 18x$$

$$27 = 20 + 2x$$

$$27 - 20 = 20 + 2x - 20$$

$$7 = 2x$$

$$\frac{7}{2} = \frac{2x}{2}$$

$$3\frac{1}{2} = x$$

4. Solve the equation below. Show your work.

$$0.4(2x + \frac{1}{2}) = 3[0.2x + (-2)] - 4$$

$$0.8x + \frac{1}{5} = 0.6x - 6 - 4$$

$$0.8x + 0.2 = 0.6x - 10$$

$$-0.6x \quad -0.6x$$

$$0.2x + 0.2 = -10$$

$$-0.2 \quad -0.2$$

$$+2x = -10.2$$

$$+2 \quad +2$$

$$x = -5.1$$

5. Determine the number of solutions that exist to the equation below. Show your work.

$$8(j - 4) = 2(4j - 16)$$

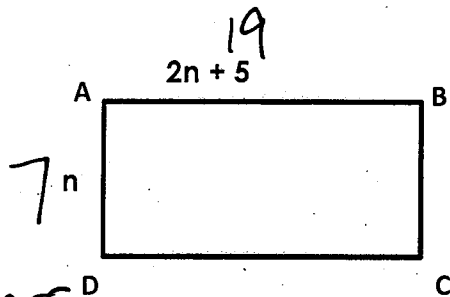
$$8j - 32 = 8j - 32$$

$$-8j \quad -8j$$

$$-32 = -32$$

infinite solutions

6. In $\square ABCD$, \overline{AB} is congruent to \overline{DC} . The perimeter of $\square ABCD$ is 52 meters. How many meters long is \overline{AD} ?



$$\overline{AD} = 7 \text{ meters}$$

$$2(2n+5) + 2n = 52$$

$$4n + 10 + 2n = 52$$

$$\begin{array}{r} 6n + 10 = 52 \\ -10 \quad -10 \\ \hline \end{array}$$

$$\begin{array}{r} 6n = 42 \\ \underline{6} \quad \underline{6} \end{array}$$

$$n = 7$$

7. Solve: $0.8m + 0.2 = 3(0.2m - 2) - 4$

$$0.8m + 0.2 = 0.6m - 6 - 4$$

$$0.8m + 0.2 = 0.6m - 10$$

$$\begin{array}{r} 0.8m + 0.2 = 0.6m - 10 \\ -0.6m \quad -0.6m \\ \hline \end{array}$$

$$\begin{array}{r} 0.2m + 0.2 = -10 \\ -0.2 \quad -0.2 \\ \hline \end{array}$$

$$\begin{array}{r} 0.2m = -10.2 \\ \underline{0.2} \quad \underline{0.2} \end{array}$$

$$m = -51$$

8. What value of a makes the equation $3(a - 6) - 8a = -2 + 5(2a + 1)$ true? Write your answer as a decimal.

$$3a - 18 - 8a = -2 + 10a + 5$$

$$\begin{array}{r} -5a - 18 = 3 + 10a \\ +5a \quad +5a \\ \hline \end{array}$$

$$\begin{array}{r} -18 = 3 + 15a \\ -3 \quad -3 \\ \hline \end{array}$$

$$\begin{array}{r} -21 = 15a \\ \underline{15} \quad \underline{15} \end{array}$$

$$\frac{-7}{5} \text{ or } \frac{-21}{15} = a$$

$$-1\frac{2}{5} = -1.4$$