

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.

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

$$\frac{3}{4}(12)=9$$

$$9=9 \checkmark$$

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

$$\left(\frac{3}{4}x + 6 = 9\right) 4$$

$$\frac{3x + 24 = 36}{-24 \quad -24}$$

$$\frac{3x = 12}{3 \quad 3}$$

$$x = 4$$

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

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

$$\frac{-22 + 24x = -4 + 24x}{-24x \quad -24x}$$

$$\frac{-22 \neq -4}{\text{No solution}}$$

3. Solve for x . Show your work.

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

$$\frac{27 - 18x = 20 - 16x}{-27 + 16x \quad -27 + 16x}$$

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

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

4. Solve the equation below. Show your work.

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

$$\frac{2}{5}(2x + \frac{1}{2}) = 3(\frac{1}{5}x - 2) - 4$$

$$\left(\frac{4}{5}x + \frac{2}{10} = \frac{3}{5}x - 6 - 4\right) 10$$

$$\frac{8x + 2 = 6x - 60 - 40}{8x + 2 = 6x - 100}$$

$$\frac{-2 \quad -2}{8x + 2 = 6x - 100}$$

$$\frac{-6x \quad +6x}{2x = -102}$$

$$\frac{2}{2} \quad \frac{-102}{2}$$

$$x = -51$$

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

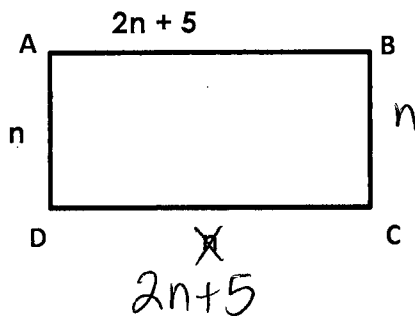
$$8(j - 4) = 2(4j - 16)$$

$$\frac{8j - 32 = 8j - 32}{-8j \quad -8j}$$

$$\frac{-32 = -32}{\text{infinite solutions}}$$

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} ?

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



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

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

$$6n+10 = 52$$

$$\begin{array}{r} 6n+10 = 52 \\ -10 \quad -10 \\ \hline 6n = 42 \\ \frac{6n}{6} = \frac{42}{6} \\ n = 7 \end{array}$$

$$n = 7$$

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

$$(0.8m + 0.2 = 0.6m - 6 - 4) \cdot 10$$

$$8m + 2 = 6m - 10 - 40$$

$$\begin{array}{r} 8m + 2 = 6m - 10 - 40 \\ -6m \quad -6m \\ \hline 2m + 2 = -100 \\ -2 \quad -2 \\ \hline 2m = -102 \\ \frac{2m}{2} = \frac{-102}{2} \\ m = -51 \end{array}$$

$$m = -51$$

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

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

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

$$\begin{array}{r} -5a - 18 = 10a + 3 \\ +5a \quad +5a \\ \hline -18 = 15a + 3 \\ -3 \quad -3 \\ \hline -21 = 15a \\ \frac{-21}{15} = \frac{15a}{15} \\ -1.4 = a \end{array}$$

$$-1.4 = a$$

$$15 \overline{) 21.0} \\ \underline{-15} \downarrow \\ 60$$