1) What value for x makes the equation true?

$$\frac{x}{5} + 15 = 25$$

2) Solve for x.

$$10x - 3x + 5 = 26$$

A $\dfrac{13}{6}$

B. 3

C. $\dfrac{31}{7}$

D. 13

3) Enrique was asked to solve the equation $3(x + 2) = 12$. His steps are shown.

Step 1: $3(x + 2) = 12$
Step 2: $3x + 6 = 12$
Step 3: $3x = 6$
Step 4: $x = 3$

Which statement about his solution is correct?

A The problem is worked correctly at each step.
B. In Step 2 the problem should be $3x + 2 = 12$.
C. In Step 3 the problem should be $3x = 18$.
D. In Step 4 the problem should be $x = 2$.

1) $\frac{x}{5} + 15 = 25$

$\frac{x}{5} + 15 - 15 = 25 - 15$ (subt. prop. =)

$\frac{x}{5} = 10$

$5 \cdot \frac{x}{5} = 5 \cdot 10$ (mult. prop. =)

$x = 50$

2) $10x - 3x + 5 = 26$

$\qquad 7x + 5 = 26$

$\qquad 7x + 5 - 5 = 26 - 5$ (subt. prop.=)

$\qquad\qquad 7x = 21$

$\qquad\qquad \dfrac{7x}{7} = \dfrac{21}{7}$ (div. prop.=)

$\qquad\qquad x = 3$

Daily HW Check:
Multi-Step. Equations: #14
Multi-Step Equations: #20

1) $13 + \text{-}9 =$ _____

2) $\text{-}20 + \text{-}2 =$ _____

3) $10 - 13 =$ _____

4) $\text{-}3 \bullet \text{-}8 =$ _____

5) $14(\text{-}2) =$ _____

6) $\text{-}15 - 18 =$ _____

7) $5 - (\text{-}9) =$ _____

8) $\text{-}7 - (\text{-}2) =$ _____

9) $100 \div \text{-}2 =$ _____

10) $(\text{-}10) \div \text{-}5 =$ _____

Solve an equation with grouping symbols.

Ex. 1) $4(2r - 8) = \dfrac{1}{7}(49r + 70)$

$8r - 32 = 7r + 10$ (dist. prop.)

$8r - 7r - 32 = 7r - 7r + 10$ (subt. prop.)

$r - 32 = 10$

$r - 32 + 32 = 10 + 32$ (add. prop. =)

$r = 42$

Ex. 2 $\frac{1}{3}(18 + 12q) = 6(2q - 7)$

$$6 + 4q = 12q - 42 \quad \text{(dist. prop.)}$$

$$6 + 4q - 4q = 12q - 4q - 42 \quad \text{(snbt. prop. =)}$$

$$6 = 8q - 42$$

$$6 + 42 = 8q - 42 + 42 \quad \text{(add. prop. =)}$$

$$48 = 8q$$

$$\frac{48}{8} = \frac{8q}{8} \quad \text{(div. prop. =)}$$

$$6 = q$$

<u>There are 3 types of solutions:</u>
<u>Infinitely Many, No Solution, and one solution</u>

<u>One Solution</u> - you get a variable equals a number

$$q = 6 \quad , \quad x = -2 \quad , \quad y = 7$$

<u>Infinitely Many Solutions (Identity Equation)</u> - you get a number equals itself or a variable equals itself.

$$3 = 3 \quad , \quad x = x \quad , \quad 2a + 3 = 2a + 3$$

<u>No Solution Equation</u> - you get a number equals another number

$$2 \neq 3 \quad , \quad 9 \neq 4$$

Ex.3

A student concluded that $8x - 12 = 4\left(\frac{1}{2}x - 6\right)$ has infinitely many solutions. Which statement best describes the student's conclusion?

A. ~~The conclusion is incorrect because the equation has no solution.~~

B. The conclusion is incorrect because there is exactly one solution to the equation.

C. ~~The conclusion is correct because there are exactly two solutions to the equation.~~

D. ~~The conclusion is correct because when simplified, both sides of the equation are equivalent.~~

$$8x - 12 = 4\left(\tfrac{1}{2}x - 6\right) \;(\text{dist prop.})$$
$$8x - 12 = 2x - 24$$
$$8x - 2x - 12 = 2x - 2x - 24 \;(\text{subt. prop.} \Rightarrow)$$
$$6x - 12 = -24$$

Ex. 4

Which statement regarding the number of solutions for the linear equation shown below is true?

$$\frac{1}{4}x - 13 = \frac{1}{4}(x + 13)$$

A. There is no solution.

B. There is exactly one solution.

C. There are exactly two solutions.

D. There are infinitely many solutions.

$$\frac{1}{4}x - 13 = \frac{1}{4}(x + 13)$$

$$(\text{dist. prop.}) \quad \frac{1}{4}x - 13 = \frac{1}{4}x + \frac{13}{4}$$

$$(\text{subt. prop.}) \quad \frac{1}{4}x - \frac{1}{4}x - 13 = \frac{1}{4}x - \frac{1}{4}x + \frac{13}{4}$$

$$-13 \neq \frac{13}{4}$$

Ex. 5 A linear equation is shown below.

$$10w + 19 + 3w = 6(9 + w) - 14$$

Which statement is true?

~~A. The equation has no solution.~~

B. The solution to the equation is 3.

C. The solutions to the equation are 3 and 7.

~~D. The equation has infinitely many solutions.~~

$$10w + 19 + 3w = 6(9 + w) - 14$$
$$10w + 19 + 3w = 54 + 6w - 14 \quad (\text{dist. prop.})$$
$$13w + 19 = 6w + 40$$