Principles of Algebra   Name/Date __Clee / Today__

WS 3C.1 – Solving Equations with the Variable on Both Sides

#1-10, Solve each equation.

1. $3(2d - 7) = (2 + 4d)2$

$$6d - 21 = 4 + 8d$$
$$-8d \qquad\qquad -8d$$
$$-2d - 21 = 4$$
$$-2d = 25$$
$$\boxed{d = -\frac{25}{2}}$$

2. $4 - (2x - 3) = 3(x - 6)$

$$4 - 2x + 3 = 3x - 18$$
$$7 - 2x = 3x - 18$$
$$\qquad -3x \qquad -3x$$
$$7 - 5x = -18$$
$$-5x = -25$$
$$\boxed{x = 5}$$

3. $5(n - 7) = 2(2 - 2n) - 3$

$$5n - 35 = 4 - 4n - 3$$
$$5n - 35 = 1 - 4n$$
$$+4n \qquad\qquad +4n$$
$$9n - 35 = 1$$
$$9n = 36$$
$$\boxed{n = 4}$$

4. $22 + 3(a + 6) = -4(3a + 5)$

$$22 + 3a + 18 = -12a - 20$$
$$40 + 3a = -12a - 20$$
$$+12a \qquad +12a$$
$$40 + 15a = -20$$
$$15a = -60$$
$$\boxed{a = -4}$$

5. $8z + 2(3 + 2z) = 3(6 + 2z)$

$$8z + 6 + 4z = 18 + 6z$$
$$12z + 6 = 18 + 6z$$
$$-6z \qquad\qquad -6z$$
$$6z + 6 = 18$$
$$6z = 12$$
$$\boxed{z = 2}$$

6. $4w + 6 - 2w = 3(6 + 2w)$

$$4w + 6 - 2w = 18 + 6w$$
$$2w + 6 = 18 + 6w$$
$$-6w \qquad\qquad -6w$$
$$-4w + 6 = 18$$
$$-4w = 12$$
$$\boxed{w = -3}$$

7. $-1.5(2d + 4) = 2(3.5 + 4d) - 2$	8. $9(y + 1) + 6 = 2(y + 3)$

7.
$$-3d - 6 = 7 + 8d - 2$$
$$-3d - 6 = 5 + 8d$$
$$\quad -8d \qquad\quad -8d$$
$$-11d - 6 = 5$$
$$\qquad -11d = 11$$
$$\boxed{d = -1}$$

8.
$$9y + 9 + 6 = 2y + 6$$
$$9y + 15 = 2y + 6$$
$$-2y \qquad\quad -2y$$
$$7y + 15 = 6$$
$$7y = -9$$
$$\boxed{y = \frac{-9}{7}}$$

9. $-2g + 4(4 + g) = 2g - 4(6 - 3g)$	10. $4z + 3(z + 1) = -22(3z - 5)$

9.
$$-2g + 16 + 4g = 2g - 24 + 12g$$
$$2g + 16 = 14g - 24$$
$$-14g \qquad\quad -14g$$
$$-12g + 16 = -24$$
$$-12g = -40$$
$$g = \frac{40}{12} \;\Rightarrow\; \boxed{g = \frac{10}{3}}$$

10.
$$4z + 3z + 3 = -66z + 110$$
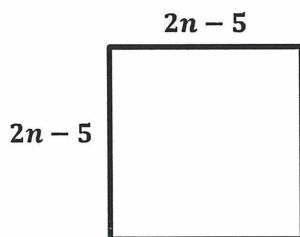$$7z + 3 = -66z + 110$$
$$+66z \qquad\quad +66z$$
$$73z + 3 = 110$$
$$73z = 107$$
$$\boxed{z = \frac{107}{73}}$$

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11. The perimeters of the two figures shown are equal. Find the value of n and the perimeter of the shapes.

$2n - 5$

$2n - 5$

$P_1 = 4(2n-5)$

$4n - 17$

$n + 3$

$P_2 = 2(4n-17) + 2(n+3)$

$$4(2n-5) = 2(4n-17) + 2(n+3)$$
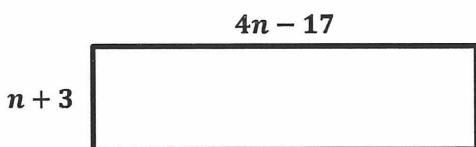$$8n - 20 = 8n - 34 + 2n + 6$$
$$-20 = 2n - 28$$
$$8 = 2n$$
$$4 = n \;\Rightarrow\; \boxed{n = 4}$$

$$\text{Perimeters} = 4(2\cdot4-5) = 4(3)$$
$$\boxed{\text{Perimeters} = 12 \text{ units}}$$

Something is wrong with this answer... can you find what it is?