

**Sec 2.1 – Solving Algebraic
Equations**

Name: _____

Find the value for the variable that makes the statement true. (SHOW WORK NEATLY)

1. $2y - 4 + 5y = 4 - 3y + 5$

2. $3g - 6 + 2g + 1 = 11 - 8g$

3. $-7x = 91$

4. $123 = 3m$

5. $\frac{2}{3}x = 12$

6. $3x + 2 = 14$

7. $2a - 6 = 5a$

8. $32 = -8 - 10b$

9. $3(m - 4) + 2m = 8$

10. $-2(h - 3) + 5h = 5(2 + h)$

I. Eliminate parenthesis by distributing.

Example

$$2(3x - 4) = 5$$

$$6x - 8 = 5$$

II. Eliminate fractions by multiplying each term by the lowest common denominator.

Example

$$\frac{1}{3}x - \frac{1}{2} = \frac{x}{4}$$

$$\frac{12}{1} \cdot \frac{1}{3}x - \frac{12}{1} \cdot \frac{1}{2} = \frac{12}{1} \cdot \frac{x}{4}$$

$$4x - 6 = 3x$$

III. Combine like terms on each side of the equation.

Example

$$\begin{array}{l} 4x + 2 - 7x = 2 + x + 8 \\ \quad \quad \quad \downarrow \quad \quad \quad \downarrow \\ -3x + 2 = 10 + x \end{array}$$

IV. Move the "variable" term to one side of the equation and the constants to the other side using addition or subtraction.

Example

$$\begin{array}{r} 3x + 2 = 6x - 5 \\ -3x \quad \quad -3x \\ \hline 2 = 3x - 5 \\ +5 \quad \quad +5 \\ \hline 7 = 3x \end{array}$$

V. Divide both sides by the coefficient (the number in front of the variable).

Example

$$\begin{array}{l} 4x = 12 \\ \frac{4x}{4} = \frac{12}{4} \\ x = 3 \end{array}$$

$$11. 2(w - 3) - 2w = 7$$

$$12. 3(2a + 3) - 2a = 2(5 + 2a) - 1$$

$$13. \frac{1}{3}x + \frac{3}{2} - \frac{5}{6}x = 3$$

$$14. \frac{2}{5}(x - 6) = \frac{5}{2}$$

$$15. \frac{1}{2}x + \frac{3}{4} - \frac{5}{2}x = \frac{3}{4} + \frac{1}{4}x$$

$$16. 2(2x - 2) = 1 - \frac{5}{2}x + 5$$

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$$17. 3\left(\frac{1}{2}x - \frac{4}{6}\right) = \frac{5}{2}x + 5$$

$$18. 3t + 4x = 6 - 2x \text{ (solve for } t\text{)}$$

$$19. 2(x + 2y) - 2 = 3x + 3 \text{ (solve for } y\text{)} \quad 20. ax + 2b = 5b - c \text{ (solve for } b\text{)}$$

$$21. \text{ If } 3a + 1 - a = 9 \text{ then what is the value of } 5a + 2?$$

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$$4x = 12$$

$$\frac{4x}{4} = \frac{12}{4}$$

$$x = 3$$

$$22. \frac{2x+1}{3} = \frac{x+1}{2}$$

$$23. \frac{x+1}{3} + \frac{2x-1}{2} = \frac{3x-1}{6}$$

$$24. 2^x = 64$$

$$25. 3^x = 243$$

$$26. 5^x = 125$$