Name: _____ Team: _____

No-Tech: Pre-Algebra

Task 1: Complete the **one-step AND two-step** equations **worksheets**.
Choose (3) problems from each document to work out. Use the guided/modeled problems on the notes as your example.

One-Step Equations Review
Two-Step Equations Review

Work out each problem **(you must show work)**. Show your work on a separate sheet of paper, if needed.**(be sure to write your name on the document - for credit for the assignment)**

Task 2: Complete the **multi-step equations AND equations with variables on both sides worksheets**. **Choose (3) problems from each document** to work out.
Multi-Step Equations Review
Variables on Both Sides Review

Use the guided/modeled problems on the notes as your example.

Work out each problem and answer the error analysis problem/discussion problem **(you must show work)**. Show your work on a separate sheet of paper. **(be sure to write your name on the document - for credit for the assignment)**

Name: _____ Team: _____

Solving One-Step Equations Review

Your Notes

Example 1 ***Solve an equation using subtraction***

Solve $y + 3 = 10$.

Solution

$y + 3 = 10$	**Write original equation.**
$y + 3 - \underline{3} = 10 - \underline{3}$	**Use subtraction property of equality: Subtract 3 from each side.**
$y = \underline{7}$	**Simplify.**

The solution is 7.

CHECK

$y + 3 = 10$	**Write original equation.**
$\underline{7} + 3 \stackrel{?}{=} 10$	**Substitute 7 for y.**
$\underline{10} = 10$ ✓	**Solution checks.**

Remember to check your solution in the original equation for accuracy.

Name: _____ Team: _____

Example 2 *Solve an equation using addition*

Solve $t - 9 = 11$.

Solution

$t - 9 = 11$	Write original equation.
$t - 9 + 9 = 11 + 9$	Use addition property of equality: Add 9 to each side.
$t = 20$	Simplify.

The solution is 20.

CHECK

$t - 9 = 11$	Write original equation.
$20 - 9 \stackrel{?}{=} 11$	Substitute 20 for t.
$11 = 11$ ✓	Solution checks.

Your Notes

Example 3 *Solve an equation using division*

Solve $8x = 56$.

The *division property of equality* can be used to solve equations involving multiplication.

Solution

$8x = 56$	Write original equation.
$\frac{8x}{8} = \frac{56}{8}$	Use division property of equality: Divide each side by 8.
$x = 7$	Simplify.

The solution is 7.

CHECK

$8x = 56$	Write original equation.
$8(7) \stackrel{?}{=} 56$	Substitute 7 for x.
$56 = 56$ ✓	Solution checks.

Name: _____ Team: _____

Example 4 *Solve an equation using multiplication*

Solve $\frac{a}{5} = 12$.

The *multiplication property of equality* can be used to solve equations involving division.

Solution

$\frac{a}{5} = 12$ — **Write original equation.**

$5 \cdot \frac{a}{5} = 5 \cdot 12$ — **Use multiplication property of equality: Multiply each side by 5.**

$a = 60$ — **Simplify.**

The solution is 60.

CHECK

$\frac{a}{5} = 12$ — **Write original equation.**

$\frac{60}{5} \stackrel{?}{=} 12$ — **Substitute 60 for *a*.**

$60 = 12$ ✓ — **Solution checks.**

Name: _____ Team: _____

Example 5 *Solve an equation by multiplying by a reciprocal*

Solve $\frac{3}{5}t = 6$.

Solution

The coefficient of t is $\frac{3}{5}$. The reciprocal of $\frac{3}{5}$ is $\frac{5}{3}$.

$\frac{3}{5}t = 6$ **Write original equation.**

$\frac{5}{3} \cdot \frac{3}{5}t = \frac{5}{3} \cdot 6$ **Multiply each side by the reciprocal** $\frac{5}{3}$.

$\frac{5}{3} \cdot \frac{6}{1} = \frac{30}{3}$

$t = 10$ **Simplify.**

The solution is 10.

CHECK

$\frac{3}{5}t = 6$ **Write original equation.**

$\frac{3}{5}(10) \stackrel{?}{=} 6$ **Substitute 10 for t.**

$6 = 6$ ✓ **Solution checks.**

Name: _____ Team: _____

1. $a + 6 = 17$	**2.** $b - 17 = 12$
3. $-3 = x + 2$	**4.** $y - 4 = -6$

5. $3x = 39$	**6.** $\frac{b}{4} = 13$
7. $-24 = 4x$	**8.** $-\frac{3}{8}m = 21$

Name: _____ Team: _____

Two-Step Equations Review

When solving a two-step equation, apply the inverse operations in the reverse order of the order of operations.

Example 1 *Solve a two-step equation*

Solve $3x + 7 = 19$.

Solution

$3x + 7 = 19$	Write original equation.
$3x + 7 - \underline{7} = 19 - \underline{7}$	Subtract 7 from each side.
$3x = \underline{12}$	Simplify.
$\frac{3x}{\boxed{3}} = \frac{12}{\boxed{3}}$	Divide each side by 3.
$x = \underline{4}$	Simplify.

The solution is 4.

CHECK

$3x + 7 = 19$	Write original equation.
$3(\underline{4}) + 7 \stackrel{?}{=} 19$	Substitute 4 for x.
$\underline{12} + 7 \stackrel{?}{=} 19$	Multiply 3 by 4.
$\underline{19} = 19$ ✓	Simplify. Solution checks.

Name: _____ Team: _____

Example 2 *Solve a two-step equation by combining like terms*

Solve $4a + 3a = 63$.

Solution

$4a + 3a = 63$	**Write original equation.**
$7a = 63$	**Combine like terms.**
$\frac{7a}{7} = \frac{63}{7}$	**Divide each side by 7.**
$a = 9$	**Simplify.**

The solution is 9.

CHECK

$4a + 3a = 63$	**Write original equation.**
$4(9) + 3(9) \stackrel{?}{=} 63$	**Substitute 9 for *a*.**
$36 + 27 \stackrel{?}{=} 63$	**Multiply 4 by 9 and 3 by 9.**
$63 = 63$ ✓	**Add. Solution checks.**

1. $\frac{r}{4} - 12 = -5$	**2.** $7k - 14 = 42$
3. $5z + 4z = 36$	**4.** $5b - 2b = 9$

Name: _____ Team: _____

Solving Multi-Step Equations Review

Example 1 ***Solve an equation by combining like terms***

Solve $3t + 5t - 5 = 11$.

Solution

$3t + 5t - 5 = 11$	**Write original equation.**
$8t - 5 = 11$	**Combine like terms.**
$8t - 5 + 5 = 11 + 5$	**Add 5 to each side.**
$8t = 16$	**Simplify.**
$\frac{8t}{8} = \frac{16}{8}$	**Divide each side by 8.**
$t = 2$	**Simplify.**

The solution is 2.

Name: _____ Team: _____

Example 2 *Solve an equation using the distributive property*

Solve $5a + 3(a + 2) = 22$.

Solution

Method 1

Show All Steps

$5a + 3(a + 2) = 22$

$5a + 3a + 6 = 22$

$8a + 6 = 22$

$8a + 6 - 6 = 22 - 6$

$8a = 16$

$\frac{8a}{8} = \frac{16}{8}$

$a = 2$

Method 2

Do Some Steps Mentally

$5a + 3(a + 2) = 22$

$5a + 3a + 6 = 22$

$8a + 6 = 22$

$8a = 16$

$a = 2$

Example 3 *Multiply by a reciprocal to solve an equation*

Solve $\frac{3}{4}(a - 5) = 9$.

Solution

$\frac{3}{4}(a - 5) = 9$ **Write original equation.**

$\frac{4}{3} \cdot \frac{3}{4}(a - 5) = \frac{4}{3} \cdot 9$ **Multiply each side by $\frac{4}{3}$.**

$\frac{4}{3} \cdot \frac{9}{1} = \frac{36}{3}$

$a - 5 = 12$ **Simplify.**

$a - 5 + 5 = 12 + 5$ **Add 5 to each side.**

$a = 17$ **Simplify.**

Name: _____ Team: _____

Checkpoint Solve the equation. Check your solution.

1. $9d - 4d - 2 = 18$	**2.** $2x + 7(x - 3) = 6$
3. $3w + 4 + w = 36$	**4.** $40 = 2(10 + 4k) + 2k$

Checkpoint Solve the equation. Check your solution.

5. $\frac{1}{2}(4x - 2) = 7$	**6.** $\frac{5}{6}(2y + 4) = 10$

Name: _____ Team: _____

Solving Equations with Variables on Both Sides Review

Example 1 *Solve an equation with variables on both sides*

Solve $15 + 4a = 9a - 5$.

Solution

Collect variables on one side of the equation and constant terms on the other to solve equations with variables on both sides.

$15 + 4a = 9a - 5$	Write original equation.
$15 + 4a - \underline{4a} = 9a - \underline{4a} - 5$	Subtract $4a$ from each side.
$15 = \underline{5a} - 5$	Simplify.
$15 + \underline{5} = 5a - 5 + \underline{5}$	Add 5 to each side.
$\underline{20} = 5a$	Simplify.
$\frac{\boxed{20}}{\boxed{5}} = \frac{\boxed{5a}}{\boxed{5}}$	Divide each side by 5.
$\underline{4} = a$	Simplify.

The solution is 4.

CHECK

$15 + 4a = 9a - 5$	Write original equation.
$15 + 4(\underline{4}) \stackrel{?}{=} 9(\underline{4}) - 5$	Substitute 4 for a.
$15 + \underline{16} \stackrel{?}{=} \underline{36} - 5$	Multiply.
$\underline{31} = \underline{31}$ ✓	Solution checks.

Name: _____ Team: _____

Example 2 ***Solve an equation with grouping symbols***

Solve $4t - 12 = 6(t + 3)$.

Solution

$4t - 12 = 6(t + 3)$	**Write original equation.**
$4t - 12 = 6t + 18$	**Distributive property**
$-12 = 2t + 18$	**Subtract $4t$ from each side.**
$-30 = 2t$	**Subtract 18 from each side.**
$-15 = t$	**Divide each side by 2.**

Checkpoint **Solve the equation. Check your solution.**

1. $3b + 7 = 8b + 2$	**2.** $6d - 6 = \frac{3}{4}(4d + 8)$

Name: _____ Team: _____

Checkpoint **Solve the equation, if possible.**

3. $5n + 34 = -2(1 - 7n)$

4. $p - 1 = 5p + 3p - 8$

Name: _____ Team: _____

Multi-Step Equations Error Analysis

Problem and Incorrect Solution	Explanation of Errors Made (some have more than one mistake)	Correct Solution (show all work)
$2x - 2 = 14$ $-2 \quad -2$ $\frac{2x}{2} = \frac{12}{2}$ $x = 6$		