Unit 1
Equations & Inequalities
Worksheet Packet

Name: _____

Solving Multi-Step Equations

1. $3x + 2 = x + 6$
2. $6 - x = 2x + 9$
3. $\frac{2}{3}p = \frac{1}{2}p + \frac{1}{3}$
4. $\frac{x+1}{3} + \frac{x+2}{7} = 5$
5. $3t^2 - 48 = 0$
6. $(x + 7)(x - 1) = (x + 1)^2$
7. $\sqrt{3t+1} = -4$
8. $\sqrt[3]{1-2x} - 3 = 0$
9. $\sqrt{2x+3} - \sqrt{x+1} = 1$

Solving Absolute Value Equations

1. $|2x| = 8$
2. $|3x| = 15$
3. $|2x + 3| = 5$
4. $|-x| = 1$
5. $|1 - 2z| = 3$
6. $2\,|x| = 8$
7. $\frac{3}{4}|x| = 9$
8. $|-2x| = 8$
9. $|9x - 1| = -10$

Solving Literal Equations

1. $P = IRT$ for T
2. $y = 5x - 6$ for x
3. $A = \frac{x+y}{2}$ for y
4. $x = \frac{yz}{a}$ for z
5. $A = h(b + c)$ for c
6. $A = \frac{r}{2L}$ for L
7. $x = \frac{2y-z}{4}$ for z
8. $12x - 4y = 20$ for y
9. $y = ax + cx$ for x

Real-World Algebraic Equations

1. *Computing Grades:* Going into the final exam, which will count as two-thirds of the final grade, Mary has test scores 86, 80, 84 and 90. What score does Mary need on the final in order to earn a B, which requires an average score of 80? What does she need to earn an A, which requires an average score of 90?

2. *Financial Planning:* Betsy, a recent retiree, requires $6000 per year in extra income. She has $50,000 to invest and can invest in B-rated bonds paying 15% per year of a certificate of deposit (CD) paying 7% per year. How much money should be invested in each to realize exactly $6000 in interest per year?

3. *Working Together:* Trent can deliver his newspapers in 30 minutes. It takes Trey 20 minutes to do the same route. How long would it take them to deliver the newspapers if they work together?

4. *Blending Teas:* The manager of a store that specializes in selling tea decides to experiment with a new blend. She will mix some Earl Gray tea that sells for $5 per pound with some Orange Pekoe that sells for $3 per pound to get 100 pounds of the new blend. The selling price of the new blend is to be $4.50 per pound, and there is to be no difference in revenue from selling the new blend versus selling the other types. How many pounds of Earl Gray tea and Orange Pekoe tea are required?

5. *Geometry:* The perimeter of a rectangle is 42 meters. Find its length and width if the length is twice the width.

Solving Algebraic Inequalities

1. $-2(x + 3) < 8$
2. $4 - 3(1 - x) \leq 3$
3. $8 - 4(2 - x) \leq -2x$
4. $\frac{1}{2}(x - 4) > x + 8$
5. $\frac{3x}{4} - \frac{x}{3} \leq \frac{1}{12}$
6. $\frac{2x - 3}{5} + 2 \geq \frac{x}{2}$
7. $\frac{5 - x}{3} \leq 6x - 4$

Solving Combined Inequalities

1. $-4 < \frac{2x - 2}{3} < 6$
2. $6 \geq \frac{3 - 3x}{12} \geq 2$
3. $-9 \leq \frac{2x + 3}{-4} \leq 7$
4. $|2x - 5| \geq 9$
5. $|2x - 5| < 9$
6. $|3x + 1| > 10$
7. $|3x + 1| \leq 10$