Name _____   Date _____

Geometry Honors – Algebra Review Packet

Evaluating Expressions
PEMDAS

1. $250 \div [5(3 \cdot 7 + 4)]$	6. $12 \div \left(-\frac{1}{3}\right)$
2. $-46 - (-81)$	7. $50.16 - (-73.54)$
3. -3^2	8. $\frac{1}{2} \cdot 26 - 3^2$
4. $(-3)^2$	9. $\frac{2 \cdot 4^2 - 8 \div 2}{(5+2) \cdot 2}$
5. $\frac{2}{5} + \frac{5}{7}$	10. Evaluate: $3x - y^3$; when x = 2 and y = -3

Solving linear equations in 1 variable
Isolate the variable by moving the variable to one side of the equation and constants to the other, and then eliminate the coefficient.

1. $15 + b = 23$	5. $p - 1 = 5p + 3p - 8$
2. $-15 + n = -9$	6. $-18 - 6k = 6(1 + 3k)$
3. $2(n + 5) = -2$	7. $-(1 + 7x) - 6(-7 - x) = 36$
4. $7(9 + k) = 84$	8. $-5(1 - 5x) + 5(-8x - 2) = -4x - 8x$

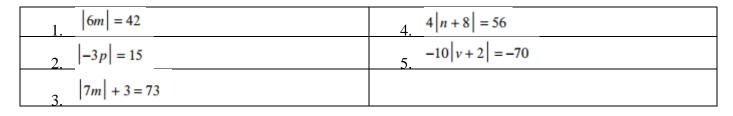## Solving Proportions (fraction = fraction)
Cross multiply and then solve. If one side is not a fraction, treat it like it is over 1.

1. $\frac{7}{5} = \frac{x}{3}$	4. $\frac{n-6}{n-7} = \frac{9}{2}$
2. $\frac{4}{3} = \frac{8}{x}$	5. $\frac{5}{r-9} = \frac{8}{r+5}$
3. $\frac{x-3}{x} = \frac{9}{10}$	

Solving absolute value equations in 1 variable

Isolate the absolute value. Create 2 equations by setting the contents of the absolute value equal to the positive and the negative value from the other side of the equation.

1. $\lvert 6m \rvert = 42$	4. $4\lvert n+8 \rvert = 56$
2. $\lvert -3p \rvert = 15$	5. $-10\lvert v+2 \rvert = -70$
3. $\lvert 7m \rvert + 3 = 73$	

Solving linear equations in 2 variables

There are an infinite number of ordered pairs (points) that solve a 2 variable equation. Graphing the line will identify all the ordered pairs. If the x,y pair is on the line, it's a solution. If you plug in an x,y pair and it works, it's a solution.

1. Graph: $y = \frac{1}{4}x + 2$	3. Graph: $2x + y = 4$
2. Graph: $y = -\frac{1}{3}x + 3$	4. Determine which ordered pairs solve the equation: y = 3x – 2 (-5, -17) (4, 8) (0, -2) (-1, -1) (-1, -5)

Solving a system of linear equations

Two methods: 1) substitution: solve 1 equation for 1 variable and substitute the resulting expression into the second equation, and 2) elimination: line up each variable and constant, then multiply (if needed to attain matching coefficients) and add/subtract the equations to eliminate a variable.

1. $2x - 3y = -1$ $y = x - 1$	5. $4x + 8y = 20$ $-4x + 2y = -30$
2. $y = -3x + 5$ $5x - 4y = -3$	6. $-3x + 7y = -16$ $-9x + 5y = 16$
3. $-5x + y = -3$ $3x - 8y = 24$	7. $5x + 4y = -30$ $3x - 9y = -18$
4. $6x + 6y = -6$ $5x + y = -13$	8. $-14 = -20y - 7x$ $10y + 4 = 2x$

Writing algebraic expressions

Convert words to algebra based on key terms

1. Four times a number decreased by twelve	3. Seven less than twice a number
2. Three more than the product of five and a number	4. Two times the sum of a number and ten

Literal Equations
Algebraically manipulate the equation to solve for the indicated variable.

1.	$2d - 3f = 9$, for f	3. $9wr = 81$, for w
2.	$P = (g - 9)180$, for g	4. $dx + t = 10$, for x

Slope

$$\text{slope} = \frac{rise}{run} \qquad m = \frac{y_2 - y_1}{x_2 - x_1}$$

1. (3, 5) and (-3, 1)	2. (1, -3) and (-1, -2)

Polynomial Multiplication
Polynomial distribution, FOIL

1. $6v(2v + 3)$	5. $(7k - 3)(k^2 - 2k + 7)$
2. $7(-5v - 8)$	6. $(x - 5)(x + 5)$
3. $(x - 3)(6x - 2)$	7. $(n + 3)^2$
4. $(3m - 1)(8m + 7)$	

Factoring Quadratic Expressions
Break the quadratic expression back into the polynomials that were multiplied to produce it

1. $b^2 + 8b + 7$	5. $3p^2 - 2p - 5$
2. $n^2 + 4n - 12$	6. $15n^2 - 27n - 6$
3. $5n^2 + 10n + 20$	7. $-6a^2 - 25a - 25$
4. $2k^2 + 22k + 60$	8. $4m^2 - 25$

Solving Quadratic Equations

Three methods: 1) graph the quadratic and identify where it crosses the x-axis, 2) set equation equal to zero, then factor the equation and set each factor equal to zero, and then solve each (inc. completing the square method), 3) quadratic equation

1. $(k+1)(k-5)=0$	4. $3r^2 - 16r - 7 = 5$
2. $n^2 + 7n + 15 = 5$	5. $6b^2 - 13b + 3 = -3$
3. $7r^2 - 14r = -7$	6. $7x^2 + 2x = 0$

Simplifying Radicals

Factor the greatest perfect square or factor tree.

1. $\sqrt{64}$	10. $2\sqrt{10} \cdot -4\sqrt{2}$
2. $\sqrt{18}$	11. $2\sqrt{3} \cdot \sqrt{5}$
3. $\sqrt{108}$	12. $\sqrt{7} \cdot \sqrt{7}$
4. $\sqrt{150}$	13. $\dfrac{\sqrt{15}}{\sqrt{12}}$
5. $\sqrt{400}$	14. $\dfrac{4\sqrt{2}}{3\sqrt{5}}$
6. $-3\sqrt{112}$	15. $\dfrac{3\sqrt{12}}{\sqrt{20}}$
7. $7\sqrt{375}$	16. $\dfrac{\sqrt{9}-\sqrt{15}}{\sqrt{3}}$
8. $\sqrt{10} \cdot \sqrt{6}$	17. $\dfrac{3+3\sqrt{15}}{3}$
9. $\sqrt{15} \cdot \sqrt{24}$	18. $\dfrac{12-\sqrt{18}}{3}$

Word Problems

Write the word problem in algebraic terms and solve

1. Six more than three times a number is thirty-three. Find the number.
2. The sum of four more than a number and twice that same number is nineteen. Find the number.
3. Two numbers total 90. The first number is ten more than seven times the second number. Find both numbers.
4. Two consecutive odd numbers total fifty-two. Find both numbers.