

Post-Algebra I, Pre-Geometry Summer Packet

(Concepts expected to be understood upon entering a high-school Geometry course)

Name _____

Algebra I information:

Grade Level _____ School _____

Teacher _____

In order to be successful in a Geometry course at the high-school level, a student needs to have a firm grasp of the material covered in Algebra I. This packet is an attempt to highlight the skills obtained in Algebra I that are used *most often* in a Geometry course. During the school year, other Algebra I - based skills that may not be covered in this packet will be necessary for success in a Geometry class, but this packet should serve as a guide to the skills considered most vital.

Part 1: Solving Equations

Solve for the variable in each equation using any method.

1. $3x + 6 = 24$	2. $\frac{3}{4}(d - 3) = 6$
3. $\frac{8r + 5 - 3r}{4} = 10$	4. $\frac{6}{w} = -24$
5. $28 = 7(y - 7)$	6. $0 = x^2 + x$
7. $9x^2 = 16$	8. $x^2 - 7x + 12 = 0$
9. $3x^2 - 6x - 2 = 4 + 5x - 7x^2$	10. $x^2 = 2x + 24$
11. $\frac{1}{2}(10 - 2a) = 2$	12. $-4 = 6n - 6$

Part 2: Simplifying and Evaluating Expressions

1. Evaluate $f(a,b) = ab^2 + \frac{1}{2}a - 3ac$ for $a = 12$, $b = -6$, $c = -4$.	2. Evaluate $f(x, y, z) = 2.5x^3 + x^{-2}y - xz$ for $x = 4$, $y = 8$, and $z = -3$.
3. Simplify: $5x^3y^4 + 7x^2y^4 - 2x^3y^4$	4. Simplify: $(5y - 6)^2$

5. Simplify: $(5x^2 - 4y^3)(3x^3 + 6y)$	6. Simplify: $8\sqrt{3} + 3\sqrt{27} - \sqrt{300}$
7. Simplify: $10\sqrt{6} \cdot 2\sqrt{2} \cdot 3\sqrt{3}$	8. Simplify: $2\sqrt{2} \cdot 3\sqrt{3} \cdot 5\sqrt{2} + 4\sqrt{3} \cdot 2\sqrt{3}$
9. Simplify: $(3x^2 - 5y)^2$	10. Simplify: $(8x - 5y)^3$

Part 3: Exponents and Radicals

Simplify the following radical expressions.

1. $\sqrt{40}$	2. $4\sqrt{24}$
3. $6\sqrt{49}$	4. $2\sqrt{28} + \sqrt{63}$
5. $6\sqrt{8} - \sqrt{98}$	6. $2\sqrt{10} \cdot \sqrt{6}$
7. $\frac{6\sqrt{48} - 2\sqrt{27}}{\sqrt{12}}$	8. $(2\sqrt{2})^2$
9. $(5\sqrt{7})^2$	10. $(\sqrt{20})^3$

Part 4: Working with Like and Unlike Terms

11. $(6x^2 + 1) + (5x^2 - 4)$	12. $(2x^3 + 11x + 2) - (x^3 - 2x + 7)$
13. $(x^2 - 3x + 3) - (x^2 + x - 1)$	14. $(14 - 16x) + (10x - 5)$

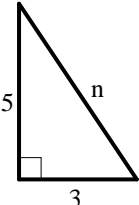
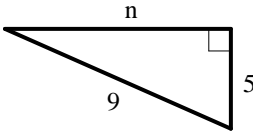
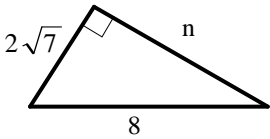
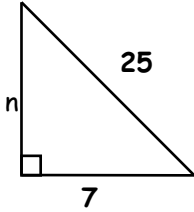
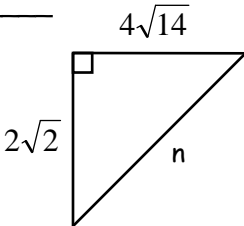
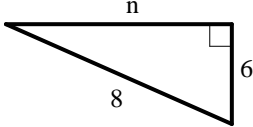
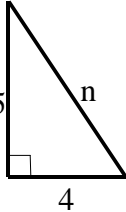
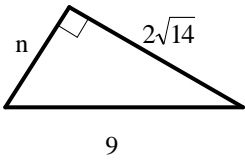
15. $(8x^3 - 1) - (20x^3 + 2x^2 - x - 5)$	16. $6x - (22x + 3 - 36x^2 + x^3)$
17. $(4x^2 - 15x + 16) + (2x - 20)$	18. $(7x^3 - 2 + x^2 + 13x) - (4x^3 + 10)$

Part 5: Factoring

Factor each expression or equation, if possible. Solve for x if you are working with an equation.

1. $3x^3 + 15x^2$	2. $x^2 + 7x = -12$
3. $x^2 - x - 6 = 0$	4. $x^2 - 25$
5. $x^2 + 4$	6. $2x^2 - 5x = 3$
7. $3x^2 - 19xy + 20y^2$	8. $16x^2 - 9y^2$
9. $10x^2 + 17xy + 3y^2$	10. $-4x = 10x^2 - 24x^3$ (careful - there are 3 answers here!)

Part 6: Pythagorean Theorem Use the Pythagorean Theorem to find n. Express n as a radical in simplest form. Show your work

11. _____ 	12. _____ 	13. _____ 
14. _____ 	15. _____ 	16. _____ 
17. _____ 	18. _____ 	

Part 7: Word Problems

<p>A CD player costs \$129.95 with a sales tax rate of 8%. What is the total cost of the CD player?</p>	<p>A car rental agency charges a fee of \$35 per day plus \$.20 for each mile driven. How much will it cost to rent the car for 4 days and drive 730 miles?</p>
<p>A chef cooks $1\frac{1}{2}$ potatoes for each serving of mashed potatoes. How many servings can he make from 18 potatoes?</p>	<p>Suppose you are selling stuffed animals for \$6 each to raise money for your club. You sold six more rabbits than monkeys. If you sold \$120 worth of stuffed animals, how many of each type did you sell?</p>
<p>Suppose a video store charges non-member \$4 to rent a video. A membership costs \$21 and then videos cost only \$2.50 to rent. How many videos would you need to rent in order to justify a membership?</p>	<p>Suppose you decide to make and sell silk flower arrangements. You spend \$220.00 on materials. You sell each flower arrangement for \$10.50 each. How much profit would you make if you sold 23 silk flower arrangements?</p>

The new parking lot has spaces for 450 cars. The ratio of spaces for full sized cars to compact cars is 11 to 4. How many spaces are for full-sized cars? How many spaces are for compact cars?

You are designing a cylindrical storage container for compost. You want it to hold 55 ft^3 and be 8 ft high. Use the formula $V = \pi r^2 h$ to find the radius of the storage container.

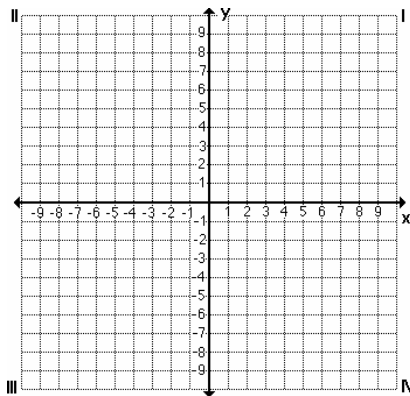
A ladder is 25 ft long. The ladder needs to reach to a window that is 24 ft above the ground. How far away from the building should the bottom of the ladder be placed?

There is a large building on fire. Fire trucks from two different stations respond to the fire. One station is 1 mi east and 2 mi north of the fire. The other station is 2 mi west and 1 mi south of the fire. How far apart are the two fire stations?

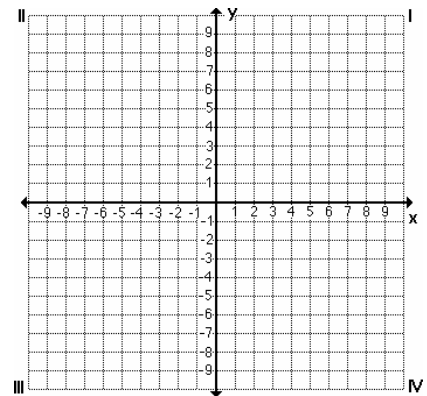
Part 8: Graphing

Graph each of the following equations or inequalities.

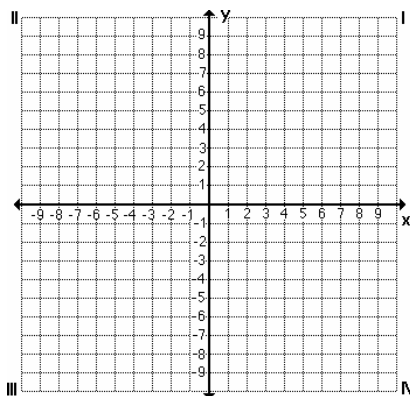
1. $x + y = 3$



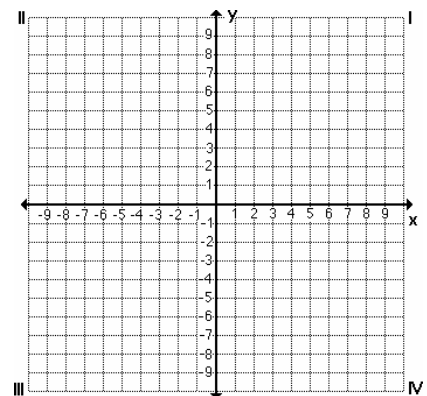
2. $y < -2$



3. $x \geq 5$

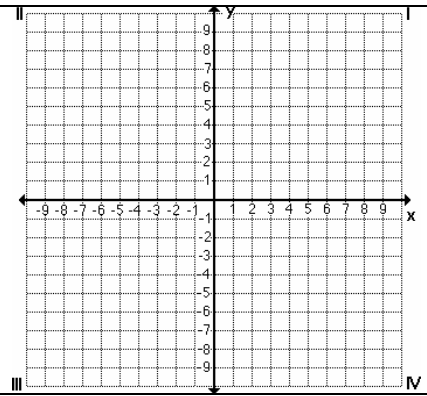
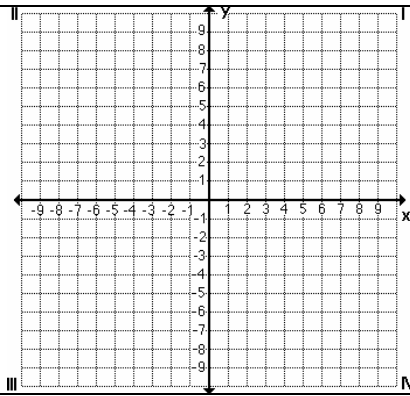


4. $2x + 6 = 3y$

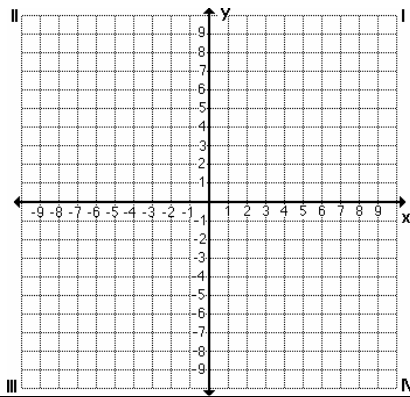


5. $y \leq -\frac{1}{3}x + 3$

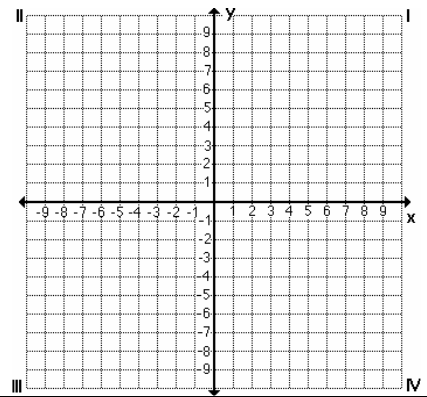
6. $\frac{1}{2}x = -y + 8$



7. $y = -\frac{3}{4}x$



8. $3 - y = \frac{1}{2}$



Part 9: Systems of Equations

Find the solution to each system of equations using either substitution or elimination.

1. $x + y = 12$
 $x = y + 2$

2. $3x + 2y = 7$
 $-x + 3y = 8$

3. $x = 3y + 1$
 $6x = y + 6$

4. $x + y = 7$
 $x - y = 9$

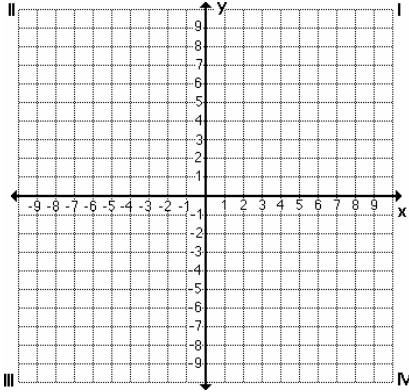
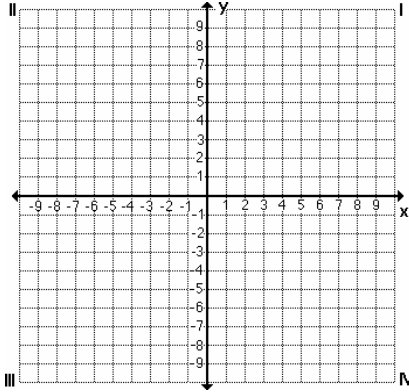
5. $y = 2x$
 $3x + y = 5$

6. $x = 4$
 $y = 3x - 5$

7. $3y = 2 - x$
 $2x = 7 - 3y$

8. $2x + 3y = -1$
 $3x + 5y = -2$

Find the solution to each system by graphing.

<p>9. $y = 2x + 1$ $-4x + y = 7$</p>  <p style="text-align: right; margin-top: 10px;">_____</p>	<p>10. $2x = y$ $x + y = 3$</p>  <p style="text-align: right; margin-top: 10px;">_____</p>
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Part 10: Working with Formulas (Distance, Midpoint, Slope)

Find the distance between each of the following pairs of points. Put all answers in reduced radical form.

$[d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}]$

<p>1. B(3, -8) and C(9, -2)</p> <p style="text-align: right; margin-top: 20px;">d = _____</p>	<p>2. X(-5, 3) and Z(4, 1)</p> <p style="text-align: right; margin-top: 20px;">d = _____</p>
<p>3. M(8, 4) and N(-2, 28)</p> <p style="text-align: right; margin-top: 20px;">d = _____</p>	<p>4. E(-4, 4) and F(0, -4)</p> <p style="text-align: right; margin-top: 20px;">d = _____</p>

Find the coordinates of the midpoint between each pair of points. $[M = (\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2})]$

<p>5. A(5, 4) and B(3, 2)</p> <p style="text-align: right; margin-top: 20px;">M = _____</p>	<p>6. C(3, 3) and D(-2, -1)</p> <p style="text-align: right; margin-top: 20px;">M = _____</p>
<p>7. T(3, -4) and R(-5, -7)</p> <p style="text-align: right; margin-top: 20px;">M = _____</p>	<p>8. S(-1, 0) and V(5, -5)</p> <p style="text-align: right; margin-top: 20px;">M = _____</p>

Find the slope of the line between each pair of points. $[m = \frac{y_2 - y_1}{x_2 - x_1}]$

<p>9. A(2, 8) and B(-10, -8)</p>	<p>10. T(0, -7) and R(10, 2)</p>
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$m = \underline{\hspace{2cm}}$	$m = \underline{\hspace{2cm}}$
11. B(8, 1) and R(-2, 5)	12. M(10, 2) and W(10, -5)
$m = \underline{\hspace{2cm}}$	$m = \underline{\hspace{2cm}}$