

## Pre-AP Algebra 2 Summer Work

- THIS WILL BE DUE ON THE **FIRST** DAY OF SCHOOL AND WILL COUNT AS A **QUIZ** GRADE.
- DO NOT COMPLETE THIS UNTIL ABOUT 1 OR 2 WEEKS PRIOR TO THE START OF SCHOOL.
- HELPFUL WEBSITES – [www.purplemath.org](http://www.purplemath.org), [www.algebrahelp.com](http://www.algebrahelp.com)

MAKE SURE YOUR  
WORK IS NEAT!!!!  
NO WORK, NO  
CREDIT! BOX YOUR  
ANSWERS!

### I. Solving Linear Literal Equations

1. Area of trapezoid – Solve for  $h$ :  $A = \frac{1}{2}h(b_1 + b_2)$
2. Volume of a cone – Solve for  $h$ :  $V = \frac{1}{3}\pi r^2 h$
3. Surface area of prism – Solve for  $L$ :  $S = 2wL + 2Lh + 2wh$

### II. Graph each equation on a separate piece of graph paper.

4.  $3x + 2y = 8$
5.  $4x - 6y = 3$
6.  $2x + 4y < 1$

### III. Solve each quadratic equation by factoring.

7.  $8x^3 - 18x = 0$
8.  $x^3 - 24x = 5x^2$
9.  $y^2 + 13y + 36 = 0$
10.  $3x^2 + 16x = 35$
11.  $2y^3 - 15y = y^2$
12.  $5y^3 + 34y^2 = 7y$

### IV. Solving each quadratic equation by using the quadratic formula. **NO DECIMALS, EXACT ANSWERS PLEASE!!!!** $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

13.  $-2x^2 + 8x + 3 = 1$
14.  $2y^2 - 8y = -5$
15.  $3x^2 - 5x = -1$
16.  $3x^2 + 2 = -8x$

### V. Solve the following systems of equations by using substitution. **NO DECIMALS!!!**

17.  $-2x + 2y = -6$   
 $4x + y = 32$
18.  $4x + 5y = 7$   
 $6x - 2y = -18$

### VI. Solve the following systems of equations by using elimination. **NO DECIMALS!!!**

19.  $-x + 8y = 16$   
 $3x + 4y = 36$
20.  $5x + 4y = 4$   
 $4x + 5y = \frac{31}{8}$

### VII. Solve each equation for the variable. **NO DECIMALS!!!**

21.  $5(6 - 4x) = x + 21$
22.  $-4(6y - 5) = 23 - 3(8y + 1)$
23.  $|4t - 3| = 6$

### VIII. Simplify the following. Use only positive exponents.

24.  $\frac{(3r^{-1}s^2t^3)^2}{27r^3st^{-2}}$
25.  $\frac{x^4}{4} \div \frac{x^3}{20}$

### IX. Simplify the following radical. Remember no radicals left in denominator.

26.  $\frac{\sqrt{x^3y^5}}{x^2\sqrt{48y^3}}$ ; Assume all variables are positive.

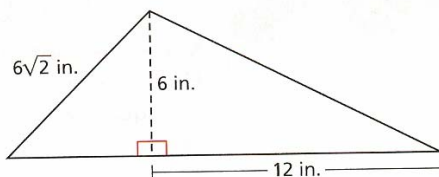
X. Application Problems: Use units in answer.

27. The baseball statistic “total bases” is calculated by adding the number of singles, twice the number of doubles, three times the number of triples, and four times the number of home runs. In 2001, a player collected 411 total bases, including 49 singles, 32 doubles, and 2 triples. How many home runs did the player hit that year?
28. A lamppost casts a shadow that is 24 feet long. Tad, who is 6 feet tall, is standing directly next to the lamppost. His shadow is 15 feet long. About how tall is the lamppost?
29. A locksmith charges \$25 to make a house call and \$15 for each lock that is re-keyed. Another locksmith charges \$10 to make a house call and \$20 for each lock that is re-keyed. For how many locks will the total costs be the same? Solve any way that you want.
30. A popular mixture of potpourri includes pine needles and lavender. If pine needles cost \$1.50 per ounce and lavender costs \$4.00 per ounce, how much of each ingredient should be mixed to make 80 oz of the potpourri that is worth \$200? Solve any way that you want.
31. A coffee shop wants to make a maximum of 120 lb of a coffee mixture that costs less than \$10/lb. The shop will mix coffee that is sold at \$8/lb with coffee sold at \$11.50/lb. Write and graph a system of inequalities that shows the possible mixtures of the two coffee types. Use graph paper.
32. The table shows the number of times a firefly flashes per minute at various temperatures.

Firefly Flashing Rate	
Temp ( $^{\circ}F$ )	Flashes per Minute
84	16
93	20
66	8

- a. Express the flashing rate  $f(T)$  as a function of temperature  $T$ .
- b. At what temperature would a firefly flash 25 times per minute?
- c. At what temperature does the firefly flash zero times?

33. The Pythagorean Theorem relates the side lengths  $a$  and  $b$  of a right triangles to the length of its hypotenuse  $c$  with the formula  $a^2 + b^2 = c^2$ .



- a. Use the Pythagorean Theorem to determine the unknown dimensions of the triangle.
- b. Find the area of the triangle.
- c. Find the perimeter of the triangle.