HOLY NAME CENTRAL CATHOLIC HIGH SCHOOL

SUMMER ASSIGNMENT FOR STUDENTS ENTERING GEOMETRY CLASS IN THE FALL OF 2011

Please complete the assignment included in this packet. The algebra review topics covered in this assignment will be needed to solve some problems you will encounter in geometry. This assignment will be due on your first day of geometry class. After a brief review, you will be tested for mastery of these topics; therefore, you should work on this assignment until you master the skills involved. Both the assignment and the test will count toward your first term grade.

If you need help with the assignment, you may consult an algebra book, a relative, another student, useful websites, and any other helpful sources. After you use all the help you need, you need to be able to solve these types of problems on your own.

If you have trouble printing this assignment, you will find the same problems on pages 755, 756, and 759 of your new geometry book.

This assignment includes the following topics: Simplifying Radicals; Simplifying Ratios; and Solving Literal Equations.

Please complete the problems on 8.5 X 11 paper. Show work as well as the final answer. Circle the final answer. Please use a separate sheet of paper for each of the three topics.

See you in geometry class.

TOPIC ONE: SIMPLIFYING RADICALS

A radical expression is in its simplest form when all three of the following statements are true.
1. The expression under the radical sign contains no perfect square factors (other than 1).
2. The expression under the radical sign does not contain a fraction.
3. The denominator does not contain a radical expression.

EXAMPLE 1 Simplify. Please note √ denotes the square root of all following numbers.

Simplify $\sqrt{12}$

$\sqrt{12} = \sqrt{4} \cdot \sqrt{3} = 2\sqrt{3}$

EXAMPLE 2

Simplify $\sqrt{(4 / 9)}$

$\sqrt{(4 / 9)} = \sqrt{(4)} / \sqrt{(9)} = 2/3$

EXAMPLE 3

Simplify $\frac{1}{\sqrt{3}}$

Multiply by $\frac{\sqrt{3}}{\sqrt{3}}$, or 1, to eliminate the radical in the denominator.

$$\frac{1}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{\sqrt{3}}{3}$$

Practice Problems

Simplify each radical expression.

1. $\sqrt{27}$ 2. $\sqrt{24}$ 3. $\sqrt{150}$ 4. $\frac{\sqrt{1}}{\sqrt{9}}$ 5. $\frac{\sqrt{72}}{\sqrt{9}}$

6. $\frac{\sqrt{228}}{\sqrt{16}}$ 7. $\frac{\sqrt{2}}{\sqrt{5}}$ 8. $\frac{\sqrt{27}}{\sqrt{75}}$ 9. $\frac{3}{\sqrt{8}}$ 10. $\frac{6\sqrt{18}}{\sqrt{48}}$

TOPIC TWO: SIMPLIFYING RATIOS

A ratio is the comparison of two or more values. Ratios may be expressed in a variety of ways. For example, the ratio of 11 to 14 may be written in the following ways:

11/14 11 : 14 11 to 14

EXAMPLE

Simplify each ratio.

a. 4 to 6

$$4 \text{ to } 6 = \frac{4}{6} = \frac{2 \cdot 2}{2 \cdot 3} = \frac{2}{3}$$

←Find and remove the common factor.→

b. 3ab : 27ab

$$3ab : 27ab = \frac{3ab}{27ab} = \frac{3ab}{9 \cdot 3ab} = \frac{1}{9}$$

c. $\frac{4a + 4b}{a + b}$

$\frac{4a + 4b}{a + b} = \frac{4(a + b)}{a + b}$ Factor the numerator. The denominator cannot be factored.
Remove the common factor $(a + b)$.

$= 4$

Practice Problems

Simplify each ratio.

1. 25 to 15
2. 6 : 9
3. $\frac{36}{54}$
4. 0.8 to 2.4
5. $\frac{7}{14x}$
6. $\frac{12c}{14c}$
7. $22x^2$ to $35x$
8. $0.5ab : 8ab$
9. $\frac{4xy}{0.25x}$
10. $1\frac{1}{2}\ x$ to $5x$
11. $\frac{x^2 + x}{2x}$
12. $\frac{r^2}{4}$ to $6r$
13. $0.72t : 7.2t^2$
14. $(2x - 6) : (6x - 4)$
15. $12xy : 8xy$
16. $(9x - 9y)$ to $(x - y)$
17. $\frac{\pi r}{r^2 + \pi r}$
18. $\frac{8ab}{32xy}$

TOPIC THREE: SOLVING LITERAL EQUATIONS

An equation with two or more variables is called a literal equation. It is often necessary to solve a literal equation for a particular variable.

EXAMPLE 1

The formula $P = 2(\ell + w)$ gives the perimeter P of a rectangle with length ℓ and width w. Solve the equation for ℓ.

$P = 2(\ell + w)$	
	Use the distributive property.
$P = 2\ell + 2w$	
	Subtract $2w$ from each side.
$P - 2w = 2\ell$	
	Divide each side by 2.
$\frac{P - 2w}{2} = \ell$	

EXAMPLE 2
The formula $A = ½ (b_1 + b_2)h$ gives the area A of trapezoid with bases b_1 and b_2 and height h. Solve for h.

$A = ½ (b_1 + b_2)h$

Multiply each side by 2.

$2A = h(b_1 + b_2)$

Divide each side by $(b_1 + b_2)$.

$$\frac{2A}{b_1 + b_2} = h$$

EXAMPLE 3
The formula for converting from degrees Celsius C to degrees Fahrenheit F is F= 9/5 C + 32. Solve for C.

$F = \frac{9C}{5} + 32$

Subtract 32 from each side.

$F - 32 = \frac{9}{5}C$

Multiply each side by $\frac{5}{9}$.

$\frac{5}{9}(F - 32) = C$

Practice Problems
Solve each equation for the given variable.

1. Perimeter of rectangle: $P = 2w + 2\ell$.	Solve for w.
2. Volume of prism: $V = \ell wh$	Solve for w.
3. Surface area of sphere: $S = 4\pi r^2$	Solve for r.
4. Lateral area of cylinder: $A = 2\pi rh$	Solve for r.
5. Area of a kite or rhombus: $A = ½ d_1 d_2$	Solve for d_2.
6. Area of circle: $A= \pi r^2$	Solve for r.
7. Area of regular polygon: $A = ½ ap$	Solve for a
8. Volume of cylinder: $V = \pi r2h$	Solve for h.
9. Area of triangle: $A = ½ bh$	Solve for h.
10. Euler's Formula: $F + V = E + 2$	Solve for V.
11. Circumference of circle: $C = 2\pi r$	Solve for r.
12. Volume of cone: $V = (1/3)\pi r^2 h$	Solve for r.
13. Area of trapezoid: $A = ½ (b_1 + b_2)h$	Solve for b_1.

END OF ASSIGNMENT