

## Summer Review Worksheet

For students taking Trig/Pre-Calculus in the upcoming school year.  
This review is optional, but highly recommended.

### I. Functions

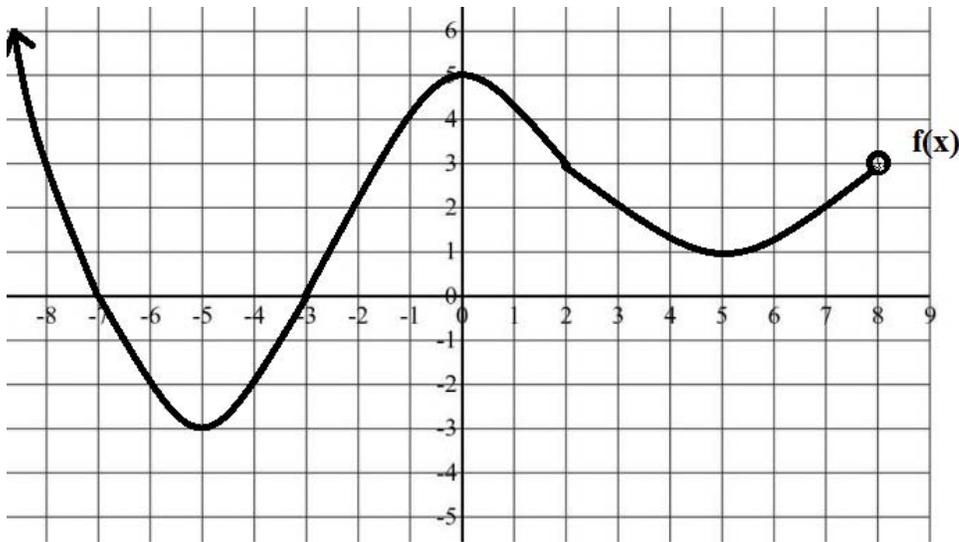
1. Provide the domain and range of the following functions in interval notation.

a.  $f(x) = 3x - 4$  Domain: \_\_\_\_\_ Range: \_\_\_\_\_

b.  $g(x) = x^2 - 4x + 5$  Domain: \_\_\_\_\_ Range: \_\_\_\_\_

c.  $h(x) = \sqrt{x - 4}$  Domain: \_\_\_\_\_ Range: \_\_\_\_\_

2. Given the graph of function  $f(x)$  below, please answer questions a – h.



a. What are the domain and range of  $f(x)$ ? D: \_\_\_\_\_ R: \_\_\_\_\_

b. What is  $f(7)$ ? \_\_\_\_\_

c. For what values of  $x$  does  $f(x) = 3$ ? \_\_\_\_\_

d. Over what intervals is  $f(x)$  increasing? \_\_\_\_\_

e. Over what intervals is  $f(x)$  decreasing? \_\_\_\_\_

f. What is the average rate of change of  $f(x)$  as  $x$  goes from -5 to 0? \_\_\_\_\_

g. Name one interval where the average rate of change of  $f(x)$  equals 0. \_\_\_\_\_

h. If  $x = -2.5$ , what is  $f(2x) =$  \_\_\_\_\_ and  $2f(x) =$  \_\_\_\_\_.

II. Solving Equations

Solve the following equations by factoring. Find all solutions (real and imaginary). *No Calculator*

1.  $x^2 - 25 = 0$

2.  $2x^2 + 5x = 12$

1. \_\_\_\_\_

2. \_\_\_\_\_

3.  $x^4 - 16 = 0$

4.  $x^4 - 5x^2 - 36 = 0$

3. \_\_\_\_\_

4. \_\_\_\_\_

5.  $x^3 + 5x^2 - x - 5 = 0$

6.  $2x^3 - 3x^2 + 16x - 24 = 0$

5. \_\_\_\_\_

6. \_\_\_\_\_

III. Quadratic Functions

1. Given  $y = -2x^2 + 12x - 16$

Find the following information:

*No Calculator*

a. Domain: \_\_\_\_\_

b. Range: \_\_\_\_\_

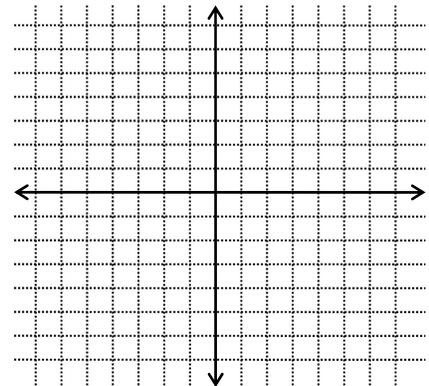
c. x-intercept(s): \_\_\_\_\_

d. y-intercept(s): \_\_\_\_\_

e. vertex: \_\_\_\_\_

f. Is this a function? Write a sentence justifying your answer.

g. Graph:



h. Using a calculator, solve the following equation. Be sure to include a copy of your calculator graph and viewing window.  
 $-2x^2 + 12x - 16 = -8$

IV. Simplifying Compound Fractions

Simplify the following compound fractions.

1.  $\frac{\frac{1}{2} + \frac{1}{x}}{1 + \frac{2}{x}}$

2.  $\frac{\frac{6}{y} - 3}{1 - \frac{1}{y-1}}$

1. \_\_\_\_\_

2. \_\_\_\_\_

V. Properties of Exponents and Radicals

Simplify the following expressions. *No Calculator*

1.  $3^2 \left( \frac{1}{3} + \frac{1}{3^{-2}} \right)$

2.  $(2x^2y^{-3}z)^4$

1. \_\_\_\_\_

2. \_\_\_\_\_

3.  $(r^{-2}y^2)^{-2}$

4.  $\frac{x^5(y^2)^3}{(x^2y)^2}$

3. \_\_\_\_\_

4. \_\_\_\_\_

5.  $\frac{a^{-2}(b^2c^3)^{-2}}{(a^{-3}b^{-5})^2c}$

6.  $\frac{\sqrt{50}}{\sqrt{2}}$

5. \_\_\_\_\_

6. \_\_\_\_\_

7.  $\sqrt{12x^4y^8}$

8.  $\frac{\sqrt{6}}{\sqrt{2}}$

7. \_\_\_\_\_

8. \_\_\_\_\_

9.  $\frac{\frac{1}{2}}{\frac{\sqrt{3}}{2}}$

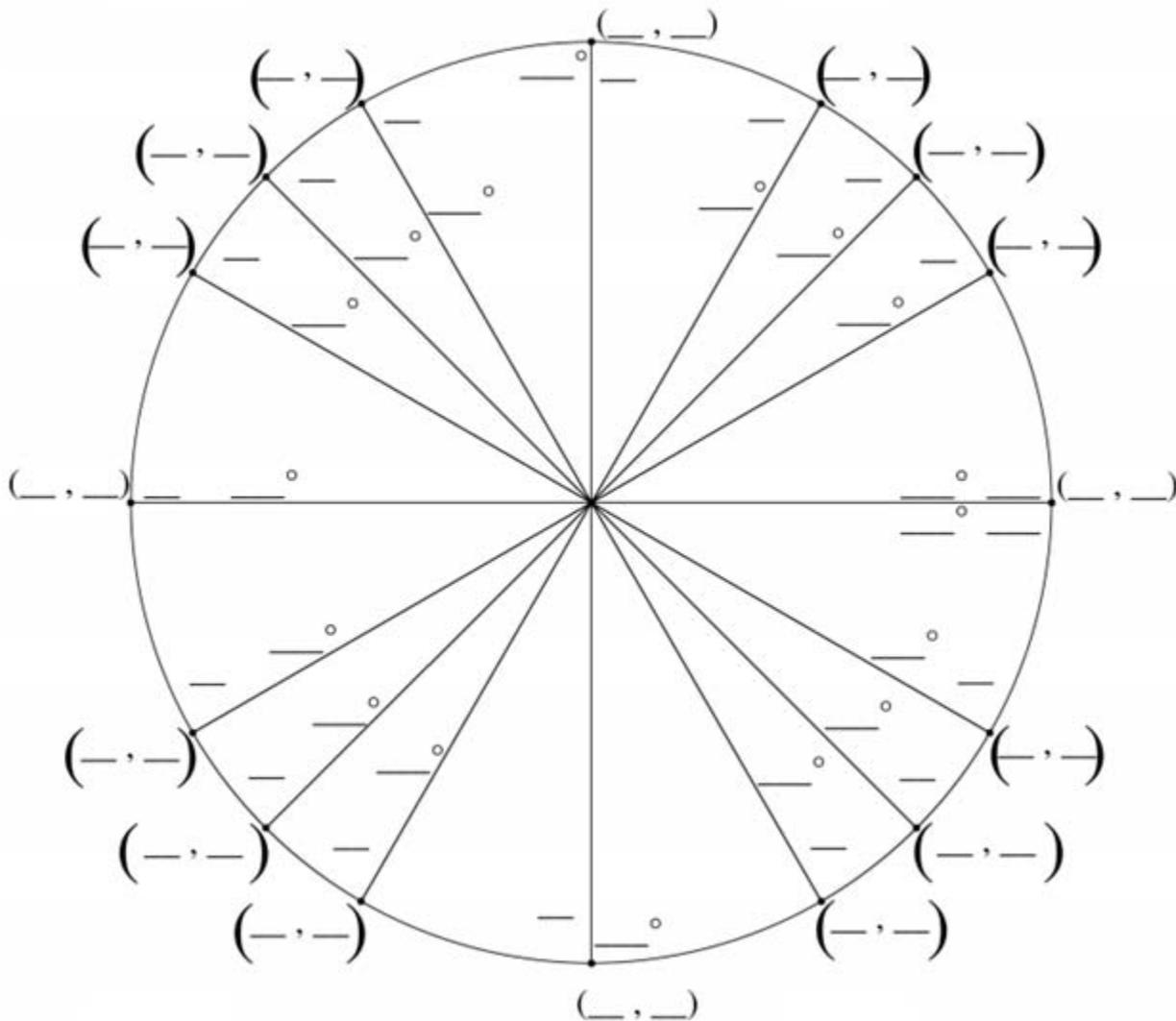
10.  $(-3\sqrt{5})^2$

9. \_\_\_\_\_

10. \_\_\_\_\_

VI. Trigonometry and the Unit Circle

Complete the following Unit Circle. Be sure to include the degree measure, radian measure, and ordered pair for each angle. *No Calculator*



Find the values. *No Calculator*

1.  $\sin 45^\circ = \underline{\hspace{2cm}}$

2.  $\cos 240^\circ = \underline{\hspace{2cm}}$

3.  $\sin 330^\circ = \underline{\hspace{2cm}}$

4.  $\sin \frac{2\pi}{3} = \underline{\hspace{2cm}}$

5.  $\cos \frac{7\pi}{6} = \underline{\hspace{2cm}}$

6.  $\sin \frac{3\pi}{2} = \underline{\hspace{2cm}}$

7.  $\cos \frac{3\pi}{4} = \underline{\hspace{2cm}}$

8.  $\sin \frac{-11\pi}{6} = \underline{\hspace{2cm}}$

9.  $\cos 0 = \underline{\hspace{2cm}}$

10.  $\sin 3\pi = \underline{\hspace{2cm}}$