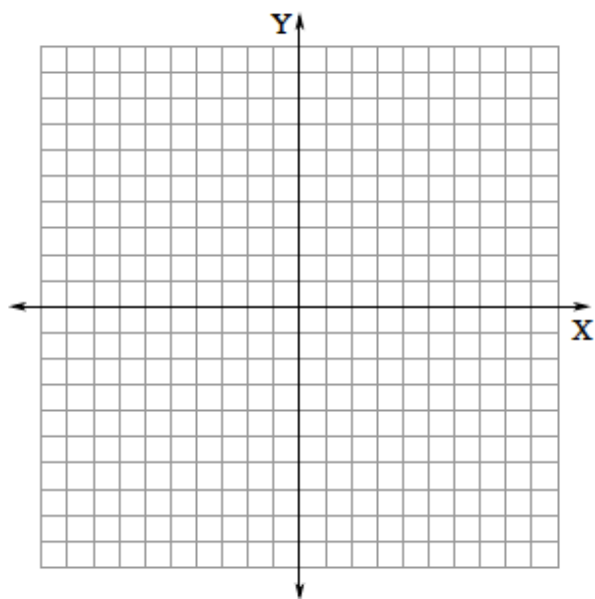


**Exam 2**  
**Chapter 2 Functions and Graphs**  
**Chapter 3 Polynomial and Rational Functions**

**Directions:** Show your work neatly and clearly to justify each of your answers.

1. Find the equation of the line passing through the points  $(3, -4)$  and  $(5, 1)$ . 1. \_\_\_\_\_
  
  
  
  
  
  
  
  
  
  
2. Given the points  $(2, 4)$  and  $(-6, 8)$ , find the distance between them and the midpoint of the line segment joining them. 2.  
Distance: \_\_\_\_\_  
  
Midpoint: \_\_\_\_\_
  
  
  
  
  
  
  
  
  
  
3. Write the standard form of the equation of the circle with center  $(-1, 4)$  and radius 5. 3. \_\_\_\_\_
  
  
  
  
  
  
  
  
  
  
4. Let  $f(x) = -x^2 + 5x$  and  $g(x) = \sqrt{2-x}$ . Evaluate each of the following: 4.
  - a.  $f(4)$  a. \_\_\_\_\_
  
  
  
  
  
  
  
  
  
  
  - b.  $f(a+1)$  b. \_\_\_\_\_
  
  
  
  
  
  
  
  
  
  
  - c.  $g(-7)$  c. \_\_\_\_\_
  
  
  
  
  
  
  
  
  
  
  - d.  $g(1)$  d. \_\_\_\_\_

5. Graph the function  $f(x) = \sqrt{x-4}$  and find its domain. Label the scale on each axis.



Domain: \_\_\_\_\_

6. Let  $f(x) = 2x^2 - 4$  and  $g(x) = 3x - 5$ , find each of the following:

a.  $(fg)(-1)$

6.

a. \_\_\_\_\_

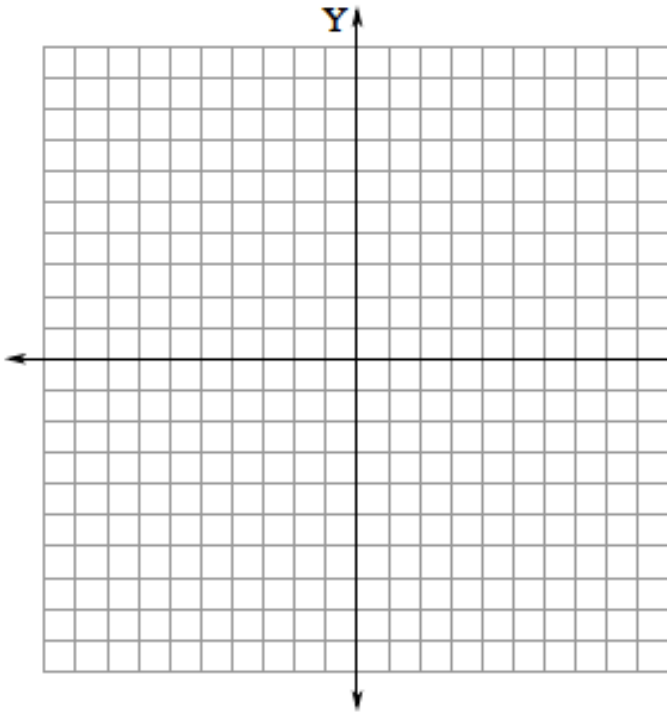
b.  $(g-f)(5)$

b. \_\_\_\_\_

c.  $(f \circ g)(2)$

c. \_\_\_\_\_

7. Graph the function  $f(x) = 2x^2 + 6x$ . Find the vertex, equation of axis of symmetry, the  $x$ -intercept(s), and  $y$ -intercept.



Vertex: \_\_\_\_\_

Equation of axis of Symmetry: \_\_\_\_\_

$x$ -intercept(s): \_\_\_\_\_

$y$ -intercept: \_\_\_\_\_

8. Use the fact that  $x = 2$  is a zero of  $p(x) = 2x^3 + x^2 - 13x + 6$  to completely factor  $p(x)$ .

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

9. Perform the indicated operations and write your answer in the form  $a + bi$ :

9.

a.  $7 + 5i - (3 - 4i)$

a. \_\_\_\_\_

b.  $(5 - 2i)(-3 - 4i)$

b. \_\_\_\_\_

**Directions:** Use the rational function defined by  $f(x) = \frac{x+1}{x-4}$  to answer each of the following.

10. Determine the equation(s) of all the asymptotes.

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

\_\_\_\_\_

\_\_\_\_\_

11. Determine the  $x$ -intercept(s).

11. \_\_\_\_\_

12. Determine the  $y$ -intercept(s).

12. \_\_\_\_\_

13. Graph the function  $f(x) = \frac{x+1}{x-4}$ . Don't forget to label the interval value on each axis.

