1. Evaluate the function $f(x) = x^2 + 8x + 6$ at the given values of the independent variable and simplify.

        **a.** $f(9)$    **b.** $f(x+7)$    **c.** $f(-x)$

   **a.** $f(9) = \boxed{\phantom{x}}$ (Simplify your answer.)

   **b.** $f(x+7) = \boxed{\phantom{x}}$ (Simplify your answer.)

   **c.** $f(-x) = \boxed{\phantom{x}}$ (Simplify your answer.)

2. Use the graphs of f and g to evaluate the composite function.

   $(f \circ g)(-1)$

   $(f \circ g)(-1) = \boxed{\phantom{x}}$
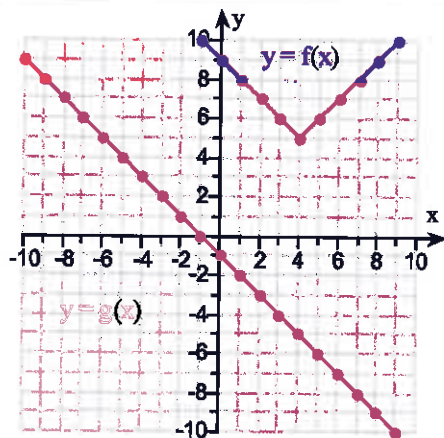
   

3. Find the difference quotient of f; that is, find $\dfrac{f(x+h) - f(x)}{h}$, $h \neq 0$, for the following function. Be sure to fully simplify.

   $f(x) = \sqrt{17x}$

   $\dfrac{f(x+h) - f(x)}{h} = \boxed{\phantom{x}}$ (Simplify your answer.)

**4.** Use the leading coefficient test to determine the end behavior of the graph of the given polynomial function. Then use this end behavior to match the polynomial function with its graph.

$$f(x) = -x^8 + x^2$$

Choose the correct graph below.

○ A.
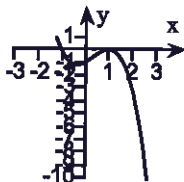
○ B.
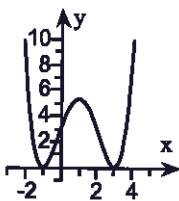
○ C.
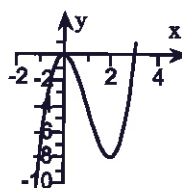
○ D.
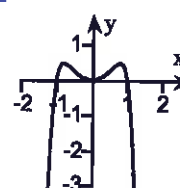
**5.** The function $f(x) = \dfrac{5x+4}{x-7}$ is one-to-one.

Find an equation for $f^{-1}(x)$, the inverse function.

$f^{-1}(x) = \boxed{\phantom{x}}$

(Simplify your answer. Use integers or fractions for any numbers in the expression.)

**6.** Find the difference quotient of f; that is, find $\dfrac{f(x+h) - f(x)}{h}$, $h \neq 0$, for the following function. Be sure to simplify.

$$f(x) = x^2 - 2x + 6$$

$\dfrac{f(x+h) - f(x)}{h} = \boxed{\phantom{x}}$ (Simplify your answer.)

Student: _____
Date: _____
Time: _____

**Instructor:** Josh Ducey
**Program:** Math 199E (Version for Math 205), Fall 2014
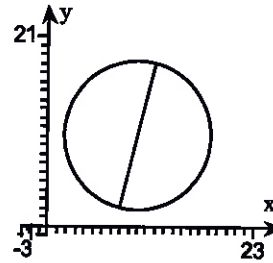**Test Bank:** MyMathTest: Basic Algebra, Precalculus and Calculus

**Assignment:** Qualifier 2: Functions and Graphs

7.  In the graph on the right, a line segment through the center of the circle intersects the circle at the points (8,2) and (12, 18) as shown.
    a. Find the coordinates of the circle's center.
    b. Find the radius of the circle.
    c. Use your answers from parts (a) and (b) to write the standard form of the circle's equation.



The center is ☐. (Type an ordered pair.)

The radius is ☐.
(Simplify your answer. Type an exact answer, using radicals as needed.)

The equation for the circle in standard form is ☐.
(Simplify your answer.)

Student: _____
Date: _____
Time: _____

**Instructor:** Josh Ducey
**Program:** Math 199E (Version for Math 205), Fall 2014
**Test Bank:** MyMathTest: Basic Algebra, Precalculus and Calculus

**Assignment:** Qualifier 2: Functions and Graphs

8.    Use the graph to determine the following.

   **a.** the function's domain
   **b.** the function's range
   **c.** the x-intercepts, if any
   **d.** the y-intercept, if any
   **e.** the function values, $f(-4)$ and $f(3)$.
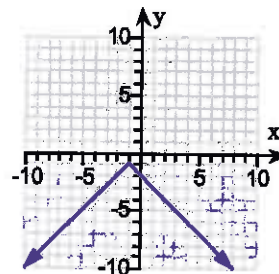
   Assume that the graph of the function continues its trend beyond the displayed coordinate grid.

**a.** What is the function's domain?

   ☐   (Type your answer in interval notation.)

**b.** What is the function's range?

   ☐   (Type your answer in interval notation.)

**c.** Find the x-intercept(s), if there are any. Select the correct choice below and fill in any answer boxes within your choice.

   ○ A.  ☐  (Type an integer. Use a comma to separate answers as needed.)
   ○ B.  There is no x-intercept.

**d.** Find the y-intercept(s), if there are any. Select the correct choice below and fill in any answer boxes within your choice.

   ○ A.  ☐  (Type an integer. Use a comma to separate answers as needed.)
   ○ B.  There is no y-intercept.

**e.** Find the values of the function.

   $f(-4) =$ ☐
   $f(3) =$ ☐

9.      Given the function $f(x) = \sqrt{x - 4}$,

(a) Find $f^{-1}(x)$.
(b) Graph $f$ and $f^{-1}$ in the same rectangular coordinate system.
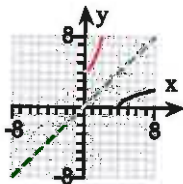(c) Use interval notation to give the domain and the range of $f$ and $f^{-1}$.
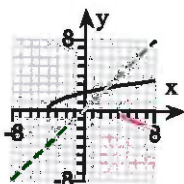
(a) Find $f^{-1}(x)$.

$f^{-1}(x) = \boxed{\phantom{x}}$; $x \geq \boxed{\phantom{x}}$

b) Choose the correct graph which shows $f$ and $f^{-1}$ graphed in the same coordinate system.
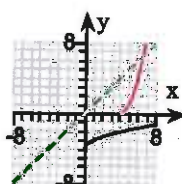
○ A.    ○ B.    ○ C.    ○ D.
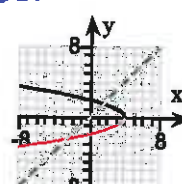


(c) State the domain and range of $f$ and $f^{-1}$ using interval notation.

Domain of $f$ = Range of $f^{-1}$ = $\boxed{\phantom{x}}$

Range of $f$ = Domain of $f^{-1}$ = $\boxed{\phantom{x}}$

10.      Find the average rate of change of the function $f(x) = x^2 + 8x$ from $x_1 = 1$ to $x_2 = 5$.

The average rate of change is $\boxed{\phantom{x}}$.