


## Homework #11

**First & Last Name:** \_\_\_\_\_ **Class:** \_\_\_\_\_

For homework to be graded, it must be *fully completed*. This means you must **show your work**.

1. Sketch the graph of a function with a domain of  $-2 \leq x < 6$  and a range of  $y > 2$ . Then sketch a second possible function.  
[Desmos](https://www.desmos.com/calculator/fa2jzshv0t) (desmos.com/calculator/fa2jzshv0t).
2. If  $f(x) = (x-3)^3 + 4$  and  $g(x) = \frac{1}{x-4} - 2$  write explicit equations for the following transformations. Homework Help 
  - a.  $h(x) = f(x+2) - 5$
  - b.  $k(x) = g(3-x) + 2$
  - c. Use set notation to state the domains and ranges of  $g$  and  $k$ .
3. Use what you know about transformations of functions to sketch graphs of the following functions. Verify that your graphs are correct using Desmos.
  - a.  $y = (x-2)^2 + 1$
  - b.  $y = \frac{1}{2}(x-1) - 5$
  - c.  $y = -|x-4| - 6$
  - d.  $y = 2^{x+1} + 3$
  - e. State the domain and range of the function in part (d). [**Challenge**] Then state the domain and range of its inverse.
  - f. [**Challenge**] Which of the functions above have inverses that are not functions? Explain how you know.
4. Rewrite  $f(x) = |x|$  as a piecewise-defined function using two linear equations. Describe how the graph grows.  
[Desmos](https://www.desmos.com/calculator/lfucy9dizo) (desmos.com/calculator/lfucy9dizo).
5. State the domain of each of the following functions.
  - a.  $f(x) = \frac{x-2}{x^2+4}$
  - b.  $g(x) = \frac{\sqrt{x+2}}{x^2+x}$
6. Multiple Choice: The values of  $x$  for which the graphs of  $y = x + 3$  and  $y^2 = 6x$  intersect are:  
**A** -3 and 3      **B** -3      **C** 3      **D** 0      **E** None of these