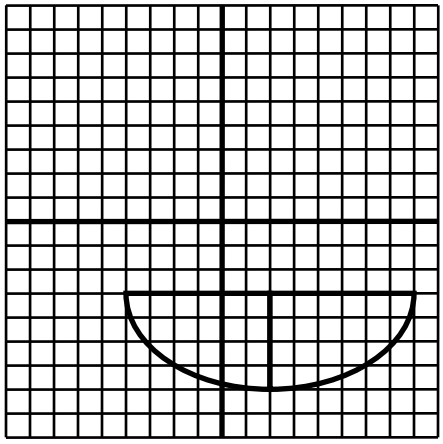
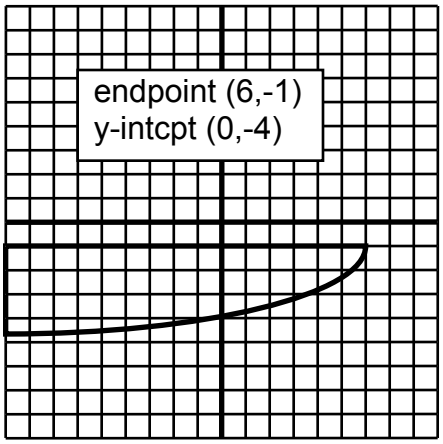
PreCalc BC Review Name:

1. Write an equation for the transformation of $y = \sqrt{1 - x^2}$ shown below.



2. Write an equation for the transformation of $y = \sqrt{x}$ shown below.



3. Given the functions $f(x) = \frac{1}{x+3}$ and $g(x) = 1 - x^2$

a. Find the domain of *f(g(x))*.

b. Find the inverse of *f(x)*.

c. Describe *f* and *g* as transformations of basic functions.

d. Find *x* such that *g(f(x))* = -3

4. Sketch each of the functions below. Then check with your calculator.

a. $y = 2^{-x} + 3$ b. $y = 2|4 - x|$ c. $y = 1 - \sqrt{2x - 4}$

5. Find the following limits:

a. $\lim_{x \to 3} \frac{x - 3}{3}$ b. $\lim_{x \to -1} \frac{x + 1}{2x + 2}$ c. $\lim_{x \to \infty} \frac{4x + 1}{2x + 2}$ d. $\lim_{x \to 3} \begin{cases} x^2 - 4, & x < 3 \\ 7, & x = 3 \\ x + 2, & x > 3 \end{cases}$

6. Chose a function from your "library" that satisfies the following conditions -- no fair looking at your library while you do this.

a) Bounded below, but no extrema

b) Odd symmetry, restricted domain

c) Continuous, odd symmetry, restricted range

7. Analyze the following function, then sketch: $y = \dfrac{x^2 - 1}{(x-3)^2}$

8.

a. What is the difference between an essential versus removable discontinuity?

b. What is a one to one function? Can a function be its own inverse? How are these two questions related?

c. Can a function have two horizontal asymptotes? More than two?

d. What is the relationship between the domain of *f(g)* and the domains of the two functions *f* and *g?*

e. Which of the following attributes are always unchanged by a vertical dilation?

f. x-intcpts, y-intcpt, symmetry, domain, range, vertical asymptotes

g. What about for a reflection over the x-axis?