

Name \_\_\_\_\_

## Honors Calculus Summer Assignment

1. Write the equation that represents a vertical shift up 3 and a horizontal shift left 4 of  $f(x) = |x|$ ?

2. If  $f(x) = \sqrt{x}$ ;  $g(x) = 3x - 2$  and  $h(x) = x^2 - 4$ , find the following, written in simplified form.

c.  $g(f(x))$

b.  $h(h(x))$

d.  $f(g(h(x)))$

3. Determine  $f(x)$  and  $g(x)$  if  $H(x) = f(g(x))$ .  $H(x) = \frac{4}{\sqrt[3]{x^3+3}}$

4. Given the values in the following table:

x	1	2	3	4	5
f(x)	3	-3	4	8	-1
g(x)	2	5	1	2	6

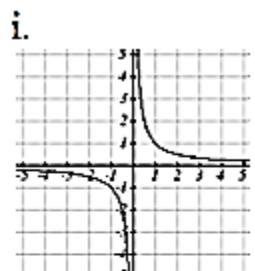
a)  $f(g(1))$

b)  $g(f(3))$

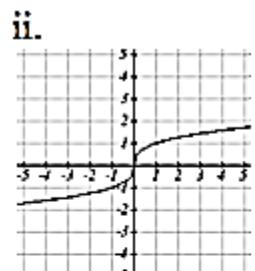
c)  $f(f(3))$

5. Match the name & equation to the graph.

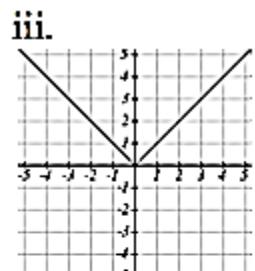
a.  $y = x$



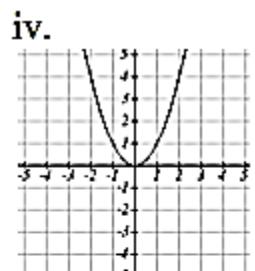
b.  $y = x^3$



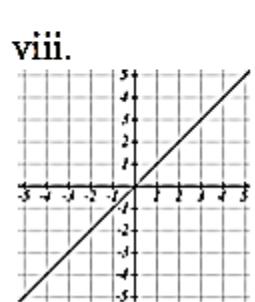
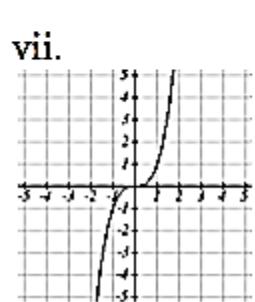
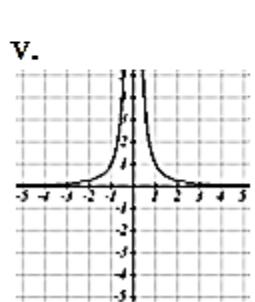
c.  $y = \sqrt[3]{x}$



d.  $y = \frac{1}{x}$

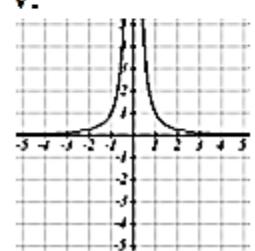


e.  $y = x^2$

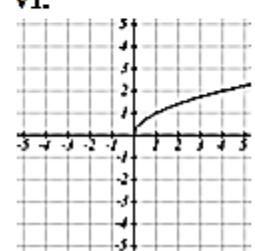


f.

$y = \sqrt{x}$



g.  $y = |x|$



h.  $y = \frac{1}{x^2}$

6. Match the description of the transformation with the equation.

Description	Function
1. Shift to the left 1 unit	a. $y = f(-x)$
2. Shift to the right 1 unit	b. $y = 2f(x)$
3. Shift up 1 unit	c. $y = f(x + 1)$
4. Shift down 1 unit	d. $y = \frac{1}{2}f(x)$
5. Makes the graph wider	e. $y = f(x) + 1$
6. Makes the graph more narrow	f. $y = f(x - 1)$
7. Reflect over the x-axis	g. $y = f(x) - 1$
8. Reflect over the y-axis	h. $y = -f(x)$

7. Find the domain of each function.

a.  $f(x) = -x^3 + 6x$

b.  $f(x) = \sqrt{9 - 2x}$

c.  $g(x) = \frac{x}{x^2 - 16}$

d.  $h(x) = \ln x$

8. Given  $f(x) = \begin{cases} x + 2, & x \geq 2 \\ 2x, & x < 2 \end{cases}$

a. Evaluate  $f\left(-\frac{3}{4}\right)$ ,  $f(2)$ , and  $f(10)$ .

b. Graph  $f(x)$ .

9. Solve each equation if  $0 \leq x \leq 2\pi$ .

a.  $\cos^2 x + \cos x = \sin^2 x$

c.  $\sin x + \sqrt{2} = -\sin x$

b.  $2\sin^2 x + 5\sin x = 3$

Solve each equation:

$$10. \ 18^{2x} = 26$$

$$11. \ \log 5x = \log(2x + 9)$$

$$12. \ -6 \log_3(x - 3) = -24$$

$$13. \ \log_6(x + 1) - \log_6 x = \log_6 29$$

$$14. \ \log_5 6 + \log_5 2x^2 = \log_5 48$$