

# Math Analysis I Honors – Review for Chapter 4 Test 2014

1. Find the domain and zeros of the following:

a)  $f(x) = \frac{2x+1}{x^2-4x-12}$

b)  $f(x) = \sqrt{x-7} - 4$

c)  $f(x) = x^2 + 2x + 1$

d)  $f(x) = \frac{\sqrt{6-x}}{x+3}$

2. Let  $f(x) = x^2 + 2x$  and  $g(x) = x + 2$  and  $h(x) = \sqrt{x+3}$ . Find the following:

a)  $(f + g)(x)$

h)  $(f \circ h)(x)$

b)  $(f - g)(x)$

i)  $f(h(6))$

c)  $(fg)(x)$

j)  $(h \circ g \circ f)(1)$

d)  $(f/g)(x)$

k)  $f(f^{-1}(5))$

e)  $(f \circ g)(x)$

l)  $h^{-1}(h(17))$

f)  $(g \circ f)(x)$

m)  $(f \circ f)(x)$

g)  $(h \circ g)(x)$

n)  $(g(f(x) - 3))$

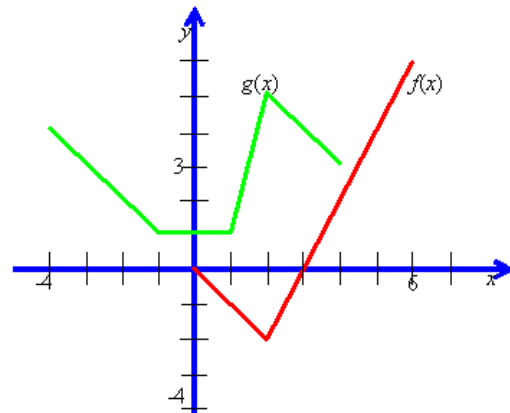
3. Given the graphs on the right for  $g(x)$  and  $f(x)$ , find the indicated function values.

a.  $(f \circ g)(-3)$

b.  $g(f(2))$

c.  $(f \circ g)(0)$

d.  $(g \circ f)(3)$



4. Given  $f(x) = 3x^2 - 5x + 4$ , find the difference quotients

a)  $\frac{f(x+h)-f(x)}{h}$

b)  $\frac{f(3+h)-f(3)}{h}$

5. Graph the piecewise functions. Then find the domain, range, and zeros.

$$a) g(x) = \begin{cases} x^2, & \text{if } x < 2 \\ 6, & \text{if } 2 \leq x < 4 \\ 10 - x, & \text{if } 4 < x \leq 6 \end{cases}$$

$$b) f(x) = \begin{cases} x^2 - 1, & x > 0 \\ 2x - 3, & -4 \leq x < 0 \end{cases}$$

6. Find the inverses of the following functions. Give the domain and range for each.

a)  $f(x) = 3x - 7$

b)  $f(x) = \sqrt{x + 5} - 6$

c)  $f(x) = \frac{4 + x}{6 - 2x}$

7. Show that the functions  $f(x)$  and  $g(x)$  are inverses using the Property of Inverse Functions. Then graph the inverse functions on the same set of axes.

$$f(x) = 4x - 5 \qquad g(x) = \frac{x + 5}{4}$$

8. Given the below periodic graph of  $f(x)$ , find:

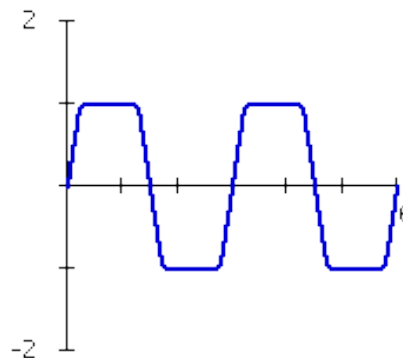
a) the fundamental period

b) the amplitude

c)  $f(1000)$

d)  $f(99)$

e)  $f(-1000)$



8. The graph of  $y=f(x)$  is shown at right. Sketch the graph of each of the following equations. Be accurate.

$Y = -f(x)$

$Y = |f(x)|$

$Y = f(-x)$

