

# Math 120 HW #3

Due: Oct. 4

## Chapter 2.1

Give the domain of the following functions

7.  $h(x) = \sqrt{x-3}$

10.

$$H(x) = \frac{x}{x+8}$$

16.

$$G(r) = \frac{2}{r^2+1}$$

Evaluate the following functions at the values indicated

18.  $H(s) = 5s^2 - 3$ ;  $H(4)$ ,  $H(\sqrt{2})$ ,  $H(2/3)$

23.  $f(x) = x^2 + 2x + 1$ ;  $f(1)$ ,  $f(-1)$ ,  $f(x+h)$

Consider the following

37. If  $f(x) = 5x + 3$ , find

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

## Chapter 2.2

29. A daily round-trip ticket to the city costs \$4.50. Write the cost of a daily round-trip ticket as a function of a passenger's income. What kind of function is this?

30. A rectangular prism has length three more than its width and height one less than twice the width. Write the volume of the rectangular prism (length  $\times$  width  $\times$  height) as a function of the width. What kind of function is this?

33. To encourage large group sales, a theater charges two rates. If your group is less than 12, each ticket costs \$9.50. If your group is 12 or more, each ticket costs \$8.75. Write a case-defined function to represent the cost of buying  $n$  tickets.

## Chapter 2.3

3. If  $f(x) = x^2 + 1$  and  $g(x) = 5$ , find the following:

3a.  $(f+g)(x)$

3b.  $(f-g)(x)$

3c.  $(f-g)(4)$

3d.  $(fg)(x)$

3e.  $(f/g)(x)$

3f.  $(f/g)(-1/2)$

3g.  $(f \cdot g)(x)$

3h.  $g(f(x))$

3i.  $g(f(-3))$

5. If  $f(x) = 3x^2 + 6$  and  $g(x) = 4 - 2x$ , find  $f(g(2))$  and  $g(f(2))$ .

10. If  $f(x) = x^2 + 2x + 1$ , find  $f(f(x))$ .

13. Find functions  $f(x)$  and  $g(x)$  so that  $h(x) = f(g(x))$  where

$$h(x) = \frac{1}{x^2 - 2}$$