

Pre Calculus  
"MONSTER" Chapter 1 Quiz

**No Calculator**

1) Select which of the two equations represents  $y$  as a function of  $x$  and specify why the other does not.

a)  $x^2 + 5y - x = 7$

b)  $y^2 - 5x = 7$

2) Let  $h(x) = 2x^2 - x - 7$ . Find  $h(2)$ .

3) For  $f(x) = 2 - 4x^2$ , find  $\frac{f(x+h) - f(x)}{h}$  and simplify.

4) Given  $f(x) = x + 5$  and  $g(x) = 6 - x^2$  find  $(f \circ g)(x)$  and  $(f \circ g)(-1)$ .

5) Is the function odd, even or neither.  
 $m(x) = x^3 - 5x^2 + 3$

6) Determine the domain and range of  $f(x) = 3 - \sqrt{x+2}$ .

7) Given  $f(x) = x + 5$  and  $g(x) = \sqrt{6-x}$  find  $(g/f)(x)$ .

8) **Multiple Choice:** The point  $(-\frac{3}{8}, 0)$  is on the graph of  $f$ . If  $g$  is a translation of  $f$ , so that  $g(x) = f(x+2) + \frac{1}{2}$ , then the coordinates of the translated point are:

(a)  $(2, \frac{1}{2})$                       (b)  $(-2, -\frac{1}{2})$

(c)  $(\frac{13}{8}, \frac{1}{2})$                       (d)  $(-\frac{15}{8}, \frac{1}{2})$

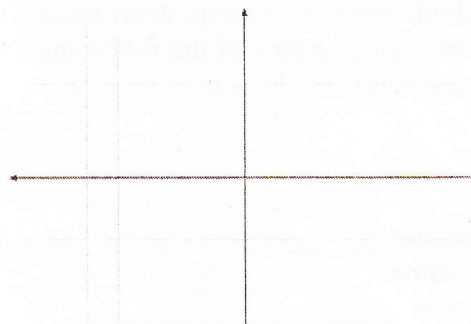
(e) None of these

9) Given:  $g(x) = -|x-5| + 2$ .

a) Identify the common function,  $f(x)$ .

b) Identify the transformations of  $g(x)$ .

c) Sketch a graph of  $g(x)$ .



10) **Multiple Choice:** Find the zeros of the function:

$$f(x) = x^3 - 7x^2 - 4x + 28$$

(a) 1, 4, 7                      (b) -2, 2, 7

(c) -7, 7, 2                      (d) -7, -4, 28

(e) None of these

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**May use calculator**

11) Use your knowledge of inverse relationships to finish the table.

x	g(x)
-2	24

x	g <sup>-1</sup> (x)

12) If f(x) and f<sup>-1</sup>(x) are inverse of each other then f<sup>-1</sup>(f(3.14)) = \_\_\_\_\_

13) Find the inverse of  $f(x) = \frac{4+5x}{7}$  algebraically.

14) Identify the increasing, decreasing and constant intervals of the following function  $h(x) = -|x + 6| - |x - 9|$ .

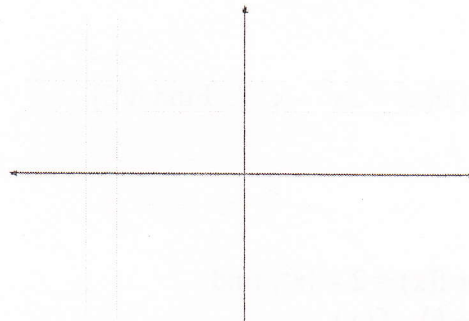
Increasing: \_\_\_\_\_  
 Decreasing: \_\_\_\_\_  
 Constant: \_\_\_\_\_

15) Use your graphing calculator to approximate (to three decimal places) any relative minimum or maximum values of the function.

$$f(x) = x^3 - 5x^2 + 6x - 1$$

16) Sketch the graph of the piecewise function by hand and determine f(-2).

$$f(x) \begin{cases} -3x - 1, & x \leq 0 \\ \sqrt{x} + 5, & x > 0 \end{cases}$$



**17) Multiple Choice:**

For what values of x does f(x) = g(x)?  
 $f(x) = 3x + 1$  and  $g(x) = x^2 - 3$

- (a) 0      (b) 4, 1      (c) -4, -1  
 (d) 4, -1      (e) None of these

True or False, if false correct statement to make it true.

18) The graphs of odd functions are symmetrical over the y-axis.

19) Explain why a one to one function passes the horizontal line test.

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**No Calculator**

1) Select which of the two equations represents  $y$  as a function of  $x$  and specify why the other does not.

(a)  $x^2 + 5y - x = 7$

b)  $y^2 - 5x = 7$  ← when solve for  $y$  there are two equations.  
 $y^2 = 5x + 7$   
 $y = \pm \sqrt{5x + 7}$

2) Let  $h(x) = 2x^2 - x - 7$ . Find  $h(2)$ .

$h(2) = 2(2)^2 - (2) - 7$   
 $2(4) - 2 - 7$   
 $8 - 2 - 7 = -1$

3) For  $f(x) = 2 - 4x^2$ , find  $\frac{f(x+h) - f(x)}{h}$  and simplify.

$\frac{[2 - 4(x+h)^2] - [2 - 4x^2]}{h}$   
 $\frac{2 - 4(x^2 + 2xh + h^2) - 2 + 4x^2}{h}$   
 $\frac{2 - 4x^2 - 8xh - 4h^2 - 2 + 4x^2}{h} = \frac{-8xh - 4h^2}{h} = -8x - 4h$

4) Given  $f(x) = x + 5$  and  $g(x) = 6 - x^2$  find  $(f \circ g)(x)$  and  $(f \circ g)(-1)$ .

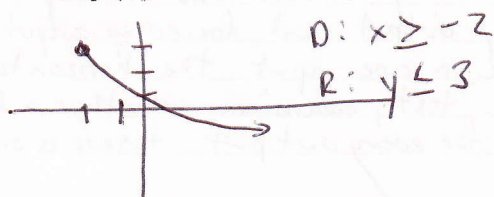
$(f \circ g)(x) = (6 - x^2) + 5 = 11 - x^2$   
 $(f \circ g)(-1) = 10$

5) Is the function odd, even or neither.

$m(x) = x^4 - 5x^2 + 3$

$m(-x) = (-x)^4 - 5(-x)^2 + 3$   
 $x^4 - 5x^2 + 3$  **even**

6) Determine the domain and range of  $f(x) = 3 - \sqrt{x+2}$ .



7) Given  $f(x) = x + 5$  and  $g(x) = \sqrt{6-x}$  find  $(g \circ f)(x)$ .

$(g \circ f)(x) = \frac{\sqrt{6-x}}{x+5}$

8) **Multiple Choice:** The point  $(-\frac{3}{8}, 0)$  is on the graph of  $f$ . If  $g$  is a translation of  $f$ , so that  $g(x) = f(x+2) + \frac{1}{2}$ , then the coordinates of the translated point are:

(a)  $(2, \frac{1}{2})$  (b)  $(-2, -\frac{1}{2})$

(c)  $(\frac{13}{8}, \frac{1}{2})$  (d)  $(-\frac{15}{8}, \frac{1}{2})$

(e) None of these

left 2 up 1/2  
 $-\frac{3}{8} - 2 = -\frac{17}{8}$   
 $0 + \frac{1}{2} = \frac{1}{2}$   
 $(-\frac{17}{8}, \frac{1}{2})$

9) Given:  $g(x) = -|x-5| + 2$ .

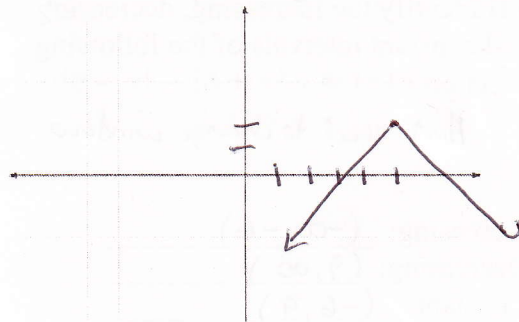
a) Identify the common function,  $f(x)$ .

$f(x) = |x|$

b) Identify the transformations of  $g(x)$ .

reflected over  $x$ -axis  
 right 5, up 2

c) Sketch a graph of  $g(x)$ .



10) **Multiple Choice:** Find the zeros of the function:

$f(x) = x^3 - 7x^2 - 4x + 28$   $x^2(x-7) - 4(x-7)$

(a) 1, 4, 7 (b) -2, 2, 7

(c) -7, 7, 2 (d) -7, -4, 28

(e) None of these

$(x^2 - 4)(x - 7)$   
 $= (x+2)(x-2)(x-7)$   
 $\pm 2, 7$

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May use calculator

11) Use your knowledge of inverse relationships to finish the table.

x	q(x)
-2	24

x	q <sup>-1</sup> (x)
24	-2

12) If f(x) and f<sup>-1</sup>(x) are inverse of each other then f<sup>-1</sup>(f(3.14)) = 3.14

13) Find the inverse of f(x) =  $\frac{4+5x}{7}$

algebraically.

$$x = \frac{4+5y}{7}$$

$$7x = 4+5y$$

$$7x-4 = 5y$$

$$\frac{7x-4}{5} = y = f^{-1}(x)$$

14) Identify the increasing, decreasing and constant intervals of the following function h(x) = -|x+6| - |x-9|.

Hint: need to change window

Increasing: (-∞, -6)  
 Decreasing: (9, ∞)  
 Constant: (-6, 9)

15) Use your graphing calculator to approximate (to three decimal places) any relative minimum or maximum values of the function.

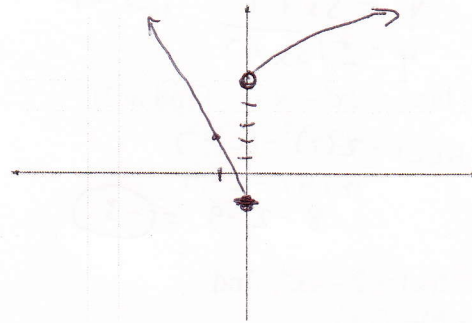
$$f(x) = x^3 - 5x^2 + 6x - 1$$

min: (2.549, -1.631)

max: (.785, 1.112)

16) Sketch the graph of the piecewise function by hand and determine f(-2).

$$f(x) = \begin{cases} -3x-1, & x \leq 0 \\ \sqrt{x}+5, & x > 0 \end{cases}$$



17) Multiple Choice:

For what values of x does f(x) = g(x)?

$$f(x) = 3x + 1 \text{ and } g(x) = x^2 - 3 \quad 3x+1 = x^2-3$$

- (a) 0      (b) 4, 1      (c) -4, -1       $0 = x^2 - 3x - 4$   
 $0 = (x-4)(x+1)$   
 (d) 4, -1      (e) None of these

True or False, if false correct statement to make it true.

18) The graphs of odd functions are symmetrical over the y-axis.

F odd symmetrical over origin or even symmetric over y-axis

19) Explain why a one to one function passes the horizontal line test.

one to one functions are that every function has one input for every output and for every output there is one input the horizontal line test; examines whether a function has for every output there is one input.