

# Pre-Calc AB Worksheet #49 : Answers

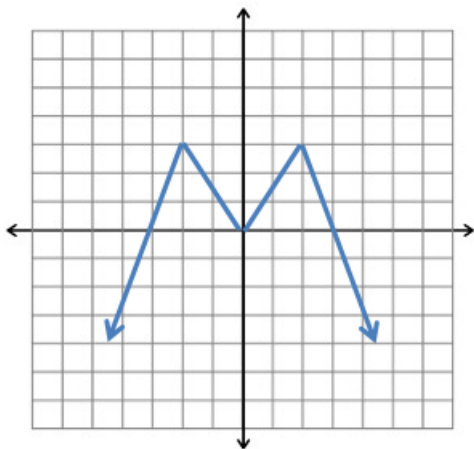
1.  $f : \mathbb{R}$ ,  
 $g : \mathbb{R}$ ,  
 $p : (-\infty, 3)$  and  $(3, \infty)$ ,  
 $q : (-\infty, 3)$  and  $(3, \infty)$
2. **I:** (a)  $(-\infty, -2)$  and  $(0, 2)$  and  $(2, \infty)$   
 (b)  $(-2, -1)$  and  $(-1, 0)$   
 (c) None  
 (d)  $(-\infty, -1)$  and  $(-1, \infty)$   
 (e)  $\mathbb{R}$   
 (f) Local Max:  $(-2, 3)$  and Local Min:  $(0, 0)$

- II:** (a)  $(-\infty, -2)$  and  $(-1, 2)$  and  $(2, \infty)$   
 (b)  $(-2, -1)$   
 (c) None  
 (d)  $(-\infty, 2)$  and  $(2, \infty)$   
 (e)  $\mathbb{R}$   
 (f) Local Max:  $(-2, 1)$  and Local Min:  $(-1, -1)$

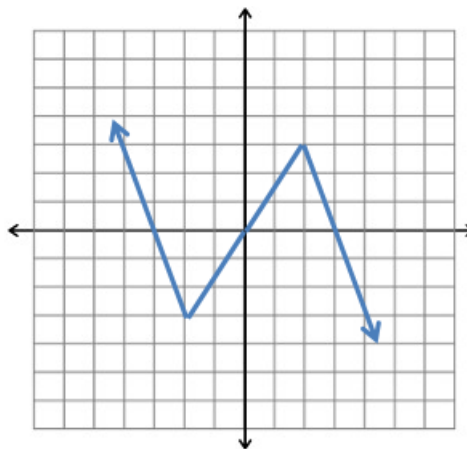
- III:** (a)  $(-2, 1)$  and  $(1, 4)$   
 (b) None  
 (c) None  
 (d)  $[-2, 1)$  and  $(1, 4]$   
 (e)  $[-1, 1)$  and  $(1, 3]$   
 (f) None

- IV:** (a)  $(-4, -2)$  and  $(0, 1)$  and  $(3, 4)$   
 (b)  $(-2, 0)$  and  $(1, 3)$   
 (c) None  
 (d)  $[-4, -2)$  and  $(-2, 0)$  and  $(0, 4]$   
 (e)  $[-1, \infty)$   
 (f) Local Max:  $(1, 3)$  and Local Min:  $(3, -1)$

3. (a) Increasing:  $(1, \infty)$ , Decreasing:  $(-\infty, 1)$   
 (b) Increasing:  $(4, \infty)$ , Decreasing:  $(-\infty, 4)$
4. (a)



(b)



5. (a) Even,  $f(-x) = f(x)$   
 (b) Even,  $g(-x) = g(x)$   
 (c) Neither,  $h(-x) = \sqrt{x^2} - x^3$   
 (d) Odd,  $k(-x) = -k(x)$

6. (a) Domain:  $(-\infty, -3]$  and  $[3, \infty)$ , Range:  $[0, \infty)$

(b) Domain:  $(-\infty, -2)$  and  $(-2, 2)$  and  $(2, \infty)$

(c) i.  $f(-2) = \text{undefined}$

ii.  $f(-x) - g(a) = \sqrt{x^2 - 9} - \frac{1}{a^2 - 4}$

iii.  $\frac{g(x+h) - g(x)}{h} = \frac{-2x - h}{(x^2 - 4)((x+h)^2 - 4)}$

(d) i.  $f \circ g(x) = \sqrt{\frac{1}{(x^2 - 4)^2} - 9}$

ii.  $g \circ f(x) = \frac{1}{(\sqrt{x^2 - 9})^2 - 4}$