Analysis Calculus – Chapter 3 Chain Rule and Trig Functions

Name

Per____Date__

Find the derivative of the following:

$$1. \quad y = \left(x^3 - \frac{7}{x}\right)^{-2}$$

$$2. \quad f(x) = \sqrt{4 + 3\sqrt{x}}$$

3.
$$g(x) = \cos^2(3\sqrt{x})$$

4. $h(x) = \sqrt{3x - \sin^2(4x)}$

5.
$$f(x) = \left[x^4 - \cos(4x^2 - 2) \right]^{-4}$$

6. $y = \sqrt{\cos(5x + 2)^3}$

 $7. \quad g(x) = \sin^3\left(\cos(2x)\right)$

8.
$$h(x) = \sin \sqrt{x} + \sqrt{\sin x}$$

9. Use the given table of values to find the following derivatives: g'(2) where $g(x) = [f(x)]^3$

$$h'(2)$$
 where $h(x) = f(x^3)$

x	f(x)	f'(x)	
2.	1	7	
8	5	-3	



x	f(x)	f'(x)	g(x)	g'(x)	
-1	2	3	2	-3	
2	0	4	1	-5	

Find F'(-1) where F(x) = f(g(x))

Find G'(-1) where G(x) = g(f(x))

11. A mass is bouncing up and down on a spring hanging from the ceiling. Its distance, y feet, from the ceiling varies sinusoidally with time t seconds, making a complete cycle every 1.6 seconds. At t=.4, y reaches its greatest value, 8 feet. The smallest value for y is 2 feet.

a) Draw a graph of the problem situation.

b) Write an equation for y in terms of t.

c) How fast is the mass moving and in what direction at t = 1? t = 1.5? t = 2.7?

d) What is the fastest the mass moves?