Math 1410 **Name:**_____

(Ch 1, §2.1 – 2.3) Let's do some review!

1. Suppose you are given the following table for the function values of $f(x)$ and $g(x)$.

x	-1/2	0	1/2	1	3/2	2
$f(x)$	1/2	1/2	1	-1/2	3/2	1
$g(x)$	2	2	-1/2	3/2	0	1

Compute the following:

(a) $(f \circ g)(-1/2)$
(b) $(g \circ f)(1)$
(c) $(f \circ f)(3/2)$
(d) $(g \circ g)(0)$

2. T F If $H(t) = \begin{cases} 21 & \text{if } t = 5 \\ t^2 & \text{if } t \neq 5 \end{cases}$, then $\lim_{t \to 5} H(t) = 21$

3. The point $P(1,1)$ lies of the curve $f(x) = \sqrt{x}$. If Q is the point $(x, \sqrt{x})$, the exact slope of the secant line PQ for the following values of x:

(a) $x = 1.5$
(b) $x = 0.5$
(c) Use the following table to determine the slope of the tangent line to the curve at $P(1,1)$

$Q(x, \sqrt{x})$	slope of secant
(1.5,)	0.449
(1.1,1.05)	0.488
(1.01, 1.004)	0.499
(0.5,)	0.586
(0.9, 0.949)	0.513
(0.99, 0.995)	0.501

4. For the function f whose graph is given, state the value of the given quantity.

(a) $\lim_{x \to -2} f(x) =$
(b) $\lim_{x \to 0^-} f(x) =$
(c) $\lim_{x \to 0^+} f(x) =$
(d) $\lim_{x \to 0} f(x) =$
(e) $\lim_{x \to 3^-} f(x) =$
(f) $\lim_{x \to 4} f(x) =$

(5-11) Compute the limit, if possible.

5. $\lim_{x\to 3} \dfrac{x^2-9}{x^2+2x-3}$

6. $\lim_{x\to 1^+} \dfrac{x^2-9}{x^2+2x-3}$

7. $\lim_{t\to 2} \dfrac{t^2-4}{t-2}$

8. $\lim_{x\to 8^-} \dfrac{|x-8|}{x-8}$

9. $\lim_{x\to 1^+} (\sqrt{x-2}+7)$

10. $\lim_{x\to 0} \dfrac{1-\sqrt{1-x^2}}{x}$ Hint: multiply the top and bottom of the fraction by $1+\sqrt{1-x^2}$.

11. $\lim_{h\to 0} \dfrac{2(x+h)-2x}{h}$

12. Prove that $\lim_{x\to 0} x^4 \cos\left(\dfrac{2}{x}\right) = 0$.

13. If $1 \le f(x) \le x^2+2x+2$ for all x, find $\lim_{x\to -1} f(x)$.