Math 141 Sections 5 & 15 Practice Test 1 Thursday September 4 2014

1. Fill out the last column of **Table One** by finding the correct limit, formula, or statement in **Table Two** that applies in each single case.

Table One

#	LIMIT, FORMULA, OR, STATEMENT	#
1	The slope of a vertical line is	
2	The average rate of change of a function $y = f(x)$ on the interval $[x_1, x_2]$ is	
3	The slope of a line given by the equation $y = mx + b$ is	
4	The instantaneous rate of change of the function $y = f(x)$ at $x = x_0$ is	
5	$\lim_{x\to 0} \frac{\sin(\alpha)}{\alpha} =$	
6	$\lim_{x\to 0} \frac{(\cos(\beta) - 1)}{\beta} =$	
7	The equation of a horizontal line in the $xy-$axis is	
8	$x = a$	
9	$x^2 - y^2 =$	
10	$x^3 + y^3 =$	

Table Two

#	COMPLEMENTARY LIMIT, FORMULA, OR STATEMENT
1	It is the equation of a vertical line in the xy-plane
2	0
3	$y = m\,x + b$, with $m = 0$
4	$(x + y)(x^2 + y^2)$
5	The slope of the secant line determined by the points $(x_1, f(x_1))$ and $(x_2, f(x_2))$
6	$\tan(\frac{\pi}{2})$
7	$(x - y)(x + y)$
8	The slope of the tangent line to the graph of $y = f(x)$, at the point $(x_0, f(x_0))$
9	$\tan(\varphi)$, φ the angle formed by the given line and the x-axis
10	1
11	There is no correct limit, formula, or statement listed

2.1 Find the following limit using algebraic methods.

$$\lim_{x \to \frac{\pi}{3}} \left\{ \frac{2\ \cos^2 x + 3\ \cos x - 2}{2\ \cos x - 1} \right\}$$

2.2 Find the following limit using algebraic methods. $\lim_{x \to 27} \left\{ \frac{x - 27}{x^{\frac{1}{3}} - 3} \right\}$

3.1 Use the Squeeze Theorem to find $\lim_{t\to 0^+}\left\{\tan t \;\; \cos(\sin(\frac{1}{t}))\right\}$

3.2 Use the Important Trigonometric Limits to find $\lim_{x\to 0}\left\{\dfrac{\sin 5x \;\; \sin 2x}{\sin 3x \;\; \sin 7x}\right\}$

3.3 Use the Important Trigonometric Limits to find $\lim_{h\to 0}\left\{\dfrac{1-\cos(2h)}{h}\right\}$

4. Fill out the next table by deciding whether or not the given statements are True (T) or False (F).

4.1.1 The limit when x goes to $-\infty$ of an even power of x is $-\infty$.

4.1.2 The limit when x goes to $-\infty$ of an odd power of x is $-\infty$.

4.1.3 The limit when x goes to $-\infty$ of x^3 is $-\infty$.

4.1.4 The limit when x goes to ∞ of x^{-3} is ∞.

4.1.5 The limit when x goes to $-\infty$ of x^{-3} is ∞.

4.1.6 The limit when x goes to $-\infty$ of an even power of x is ∞.

4.1.7 The limit when x goes to $-\infty$ of an odd power of x is ∞.

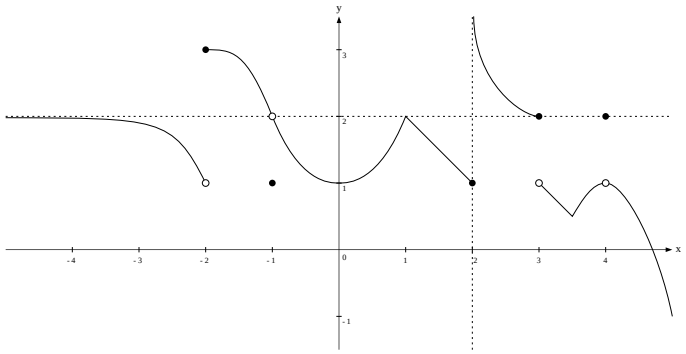
4.1.8 The limit when x goes to $-\infty$ of x^3 is ∞.

4.1.9 The limit when x goes to ∞ of x^{-3} is $-\infty$.

4.1.10 The limit when x goes to $-\infty$ of x^{-3} is ∞.

#	T	F
4.1.1		
4.1.2		
4.1.3		
4.1.4		
4.1.5		
4.1.6		
4.1.7		
4.1.8		
4.1.9		
4.1.10		

4.2 Fill out the boxes with the correct answer about the graph of the function $y = f(x)$ given below.



4.2.1 Is the given function left continuous when x, takes the values $0, 1, 2, 3$?

YES	NO

Table 4.2.1

4.2.2 Does the function have a jump discontinuity when x takes the values $-2, -1, 2, 3$?

YES	NO

Table 4.2.2

4.2.3 Write your answer inside the box

$$\lim_{x \to -\infty} f(x) =$$

ANSWER:

Table 4.2.3