Math 181 quiz 2 solution Name: Key

McDonald Date: 22 September 2008

You must show work!!

Find the limit, if exists. Write infinity if the limit is infinite.

1. $\lim_{x\to 0}\frac{1-\cos x}{x}=0$ by memorized identity 1. _____

2. $\lim_{x\to 3}\sqrt[3]{x-3}=\sqrt[3]{3-3}=\sqrt[3]{0}=0$ 2. _____

direct substitution

3. $\lim_{x\to 2^+}\frac{|x-2|}{x-2}$ *if* $x>2$, *then* $\lim_{x\to 2^+}\frac{|x-2|}{x-2}=\lim_{x\to 2^+}\frac{x-2}{x-2}=\lim_{x\to 2^+}1=1$ 3. _____

4. $\lim_{x\to 3}\frac{1}{x-3}$, = dne 4. _____

$\lim_{x\to 3^+}\frac{1}{x-3}=\infty$ and $\lim_{x\to 3^-}\frac{1}{x-3}=-\infty$

5. $\lim_{x\to \frac{\pi}{2}^-}\sec x=\lim_{x\to \frac{\pi}{2}^-}\frac{1}{\cos x}=\infty$ Note: it still does not exits. 5. _____

Look at graph or plug in numbers.

Find the derivative of each function.

6. $f(x)=3x^3-2x-\pi$ (pi is a constant) 6. _____

$f'(x)=9x^2-2$

7. $y=\frac{1}{x^2}=x^{-2},\ y'=-2x^{-2-1}=-2x^{-3}=-\frac{2}{x^3}$ 7. _____

8. $h(x)=3\sin x,\ h'(x)=3\cos x$ 8. _____

9. $k(\theta)=\tan\theta,\ k'(\theta)=\sec^2\theta$ 9. _____

10. $f(x)=5x^4-\sqrt{7}x^2+6,\ f'(x)=20x^3-2\sqrt{7}x$ 10. _____