

## MA 131 - Final Exam Review for 4/24/08

1. Use the definition of derivative to find  $f'(-1)$  if  $f(x) = (4x+1)^2$ .

2. Find  $\frac{dy}{dx}$  if  $y = \sin^{-1}(x)$ .

3. If  $f(x) = \ln(4x^2)$ , find  $f'(x)$ .

4. If  $f(t) = \cot(2t)$ , find  $f'(t)$ .

5. If  $f(x) = \frac{x-1}{x^2+2}$ , find  $f'(x)$ .

6. If  $g(x) = \sec^4(\cos(x^2))$ , find  $g'(x)$ .

7. Given the function  $f(x) = \frac{x^2 - 16}{2x^2 + 7x - 4}$ :

A) Find the locations and types of any discontinuities.

B) If any of the above discontinuities are removable, define  $f(a)$  so that  $f(x)$  will become continuous at  $x=a$ .

8.  $\lim_{x \rightarrow \infty} \frac{1}{\cos\left(\frac{1}{x}\right)}$

9.  $\lim_{x \rightarrow \infty} \frac{\sqrt{x^4 - 2}}{x^2 + 3}$

10.  $\lim_{x \rightarrow 0} \frac{3x}{\sin(x)}$