

MATH 1080, SPRING 2006, PRACTICE EXAM 1

1. Go over all HW problems with solution key posted on the website.
2. Memorize all definitions and formula/rules.
3. Emphasized materials (the followings are just examples of emphasized materials).

(1) Find the following.

(a) $\lim_{x \rightarrow 0} \frac{\sin(2x)}{x} =$

(b) $\lim_{x \rightarrow 0} \frac{\tan(2x)}{x} =$

(c) $\lim_{x \rightarrow 0} \frac{\cos(2x)}{x} =$

(d) $\lim_{x \rightarrow 1} \frac{x^2 + x - 2}{x - 1} =$

(e) $\lim_{x \rightarrow \infty} \frac{1}{1 - x} =$

(2) Find $f'(x)$ of $f(x) = -2x^3 + 1$ by using the limit definition.

(3) Find $f'(x)$ of the HW problems in Set 2, 3 and 4 by using the derivative rules.

(4) Approximate $(2.01)^{10}$, $e^{0.1}$ and $\ln(1.1)$ by using the linear approximation.

(5) Find the equation of the tangent line of the curve given by the function $f(x) = \sin(2x) - e^{x^2}$ at $x = 0$.

(6) Determine whether the following function is continuous at $x = 0$ and $x = 1$ and

justify your answer. $f(x) = \begin{cases} 0 & \text{if } x \leq 0 \\ x^2 - x & \text{if } 0 < x \leq 1 \\ 1 & \text{if } 1 < x \end{cases}$

(7) Velocity and Acceleration problems: What is the relation among position, velocity, speed, acceleration? (Recall the table regarding them given in class and go over the last problem on HW Set 4.)