Prep for Test # 1

Covers Chapters, Sections:

2.1 Preview of Calculus
2.2 Limits, concept
2.3 Finding Limits
2.4 Continuity
3.1 Definition of Derivative
3.2 Derivative as a Function
3.3A Basic Rules of Differentiation
does NOT include Product and Quotient Rules

Test Format

Part I: 15 of 17 short answer
(60pts @4 pts)

For problems with multiple select, partial credit can be earned.

Part II: choice of 4 of 5 problems
(40pts @10 pts)

Partial credit will be assigned for all problems on Part II.

1. Review Homework
   Look especially at the more complex problems from each section.
2. Review Class Notes
   a) Check first page: Do you know each topic?
   b) Redo the sections needed.
3. Review Quizzes
   Contain simpler problems, so treat them as a minimum of the information you should know.
4. Do problems in the Chapter Reviews
   a) Offer fresh problems about same topics.
   b) But, be careful that the topic was covered.
5. Study in Groups with Other Students
   Talking about math helps you to think more clearly about it and to remember it.

$\lim_{t\to 9} \frac{t-9}{\sqrt{t}-3} \to \frac{0}{0}$ ∴ limit exists

$\frac{t-9}{\sqrt{t}-3} \cdot \frac{\sqrt{t}+3}{\sqrt{t}+3} = \frac{(t-9)(\sqrt{t}+3)}{t-9}$

$= \lim_{t\to 9} (\sqrt{t}+3) = 3+3 = 6$

G: $f(x) = \begin{cases} 3x+2, & x < k \\ 2x-3, & k \le x \le 8 \end{cases}$

F: $k \Rightarrow f(x)$ cont. $(-\infty, 8]$

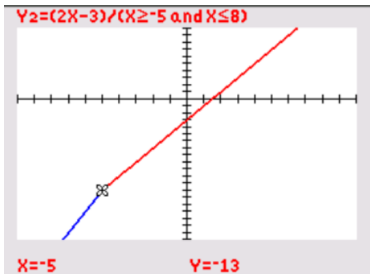
cont.: $\lim_{x \to k} f(x) = f(k)$

3x+2 continuous, 2x-3 continuous - both polynomials
only possible discontinuity is at x = k where definition changes

need $\lim_{x \to k^-} 3x+2 = \lim_{x \to k^+} 2x-3$

$3k+2 = 2k-3$

$k = -5$



$f(x) = \frac{2}{x+1}$

$f'(x) = \frac{(x+1)(0) - 2(1)}{(x+1)^2}$

$f'(x) = \frac{-2}{(x+1)^2}$

$f'(-3) = \frac{-2}{(-2)^2} = \frac{-2}{4} = -\frac{1}{2} = m_T$

F: e.g. tangent line at $x = -3$

$y - y_1 = m_1(x - x_1)$

need y_1 and m_T.

$f(-3) = \frac{2}{-3+1} = \frac{-2}{2} = -1$

$\therefore y - (-1) = -\frac{1}{2}(x - (-3))$

$y + 1 = -\frac{1}{2}(x+3) = -\frac{1}{2}x - \frac{3}{2}$

$y = -\frac{1}{2}x - \frac{5}{2}$