MA 141 TEST # 2 Name: _____
October 6, 2000 SS #: _____
Show All Work Row #: _____

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1. (10 pts each) Find the limit for each of the following quations:
   (a) $\lim_{t\to 0} \frac{\sqrt{2-t}-\sqrt{2}}{t}$.
   (b) $\lim_{x\to 1} \frac{x^2+x-2}{x^2-3x+2}$.
   (c) $\lim_{x\to\infty}(\sqrt{x^2+x+1}-\sqrt{x^2-x})$.
   (d) $\lim_{x\to\infty} \frac{\sqrt{1+4x^2}}{4+x}$.
2. (10 pts) Find the line tangent to the parabola $y = 1 + x + x^2$ at the pont $(-1, 1)$.
3. (10 pts each) If a ball is thrown into the air with a velocity of 40 ft/s, its height (in feet) after t seconds is given by $h(t) = 40t - 16t^2$.
   (a) Find the velocity when $t = 2$.
   (b) Find the time when the ball reaches its heighest point.
4. (10 pts each) Find the derivative of the following functions:
   (a) $f(x) = x^3 + 3x$.
   (b) $f(x) = \frac{x}{x^2-1}$.
5. (10 pts) Sketch the graph of the rational function
$$y = \frac{1-4x}{2x+2},$$
   and indicate any vertical or horizonal asymptotes.