232 Quiz R
September 2, 2011.

Section: _____ **Name:** * KEY * V2

Work individually. No technology, Notebooks, or other material allowed.

You do NOT need to show work for any of these problems.

1. Find the derivative of $f(x) = (3x^2+1)^4(5x-2)^2$.

$f'(x) = \boxed{4(3x^2+1)^3(6x)(5x-2)^2 + (3x^2+1)^4(2)(5x-2)(5)}$

2. If $f'(x) = 3x+1$ and $f(0) = 4$, find $f(x)$.

$f(x) = \frac{3}{2}x^2 + x + C$

$f(0) = 4 \rightarrow 4 = \frac{3}{2}(0) + 0 + C \Rightarrow C = 4$

so $\boxed{f(x) = \frac{3}{2}x^2 + x + 4}$.

3. Find $\lim_{x\to\infty} \frac{(x+3)(2x+1)}{4x^2-1}$.

balanced rational fncn

so $\rightarrow \frac{2}{4} = \boxed{\frac{1}{2}}$. (ratio of leading coeff.)

4. Find the interval(s) on which the function $f(x) = x^3 - 3x^2 - 8$ is increasing.

$f'(x) = 3x^2 - 6x = 0$

$3x(x-2) = 0$

so f increasing on $\boxed{(-\infty, 0) \text{ and } (2, \infty)}$.