MATH 104 TUTORIAL 6

1. Use L'Hopital's Rule to evaluate the limits.

a. $\lim_{x\to\infty} \frac{5x^2 - 3x}{7x^2 + 1}$

b. $\lim_{x\to\infty} \frac{2x^2 + 3x}{x^3 + x + 1}$

c. $\lim_{x\to\infty} \frac{5x^3 - 2x}{7x^3 + 3}$

d. $\lim_{x\to 0} \frac{\sin x - x}{x^3}$

e. $\lim_{x\to 0^+} x^x$

f. $\lim_{x\to\infty} (1 + 2x)^{1/(2\ln x)}$

2. Find the value.

$$\sin\left(\cos^{-1}\left(\frac{\sqrt{2}}{2}\right)\right)$$

3. Find the derivative of y.

a. $y = \sin^{-1}(1 - t)$

b. $y = \tan^{-1}(\ln x)$

4. Evaluate the integrals.

a. $\int \frac{dx}{\sqrt{9 - x^2}}$

b. $\int_0^1 \frac{4\,ds}{\sqrt{4 - s^2}}$

c. $\int \frac{dx}{9 + 3x^2}$