Methods of Calculus Math 1225B, 1st Assignment
Due Monday June 30th in class

1. Evaluate the following expressions:

   a) $(\frac{1}{16})^{-1/4}(\frac{27}{64})^{1/4}$ *b*) $\frac{5^{2.3}}{5^{-0.3}.5^{1.2}}$ *c*) $\log_3 81$ *d*) $\ln \frac{1}{e^{2/3}}$

2. Solve the following equations:

   a) $3^{x-1} = \frac{1}{9^{2x}}$ *b*) $\log_3(t+4) + \log_3(t-4) = 1$

3. Compute

   a) $\frac{d}{dx}(x^2 e^{x^2} + 5^{2x+1})$ *b*) $\frac{d}{dx}(\ln(x^2+5x) + \frac{x}{e^x})$ *c*) $\frac{d}{dx}(\log_5(e^x+5x))$

4. Use logarithmic differentiation to compute

$$\frac{d}{dx}\Big(\frac{x^{1/2}(x-5)^7(x+6)^3}{(x+1)^2}\Big)$$

5. Evluate

   a) $\sin(-\pi/3)$ *b*) $\tan(7\pi/6)$ *c*) $\sec(3\pi/4)$

6. Verify the following identity:

$$\frac{\sec\theta}{\tan\theta + \cot\theta} = \sin\theta$$