

**Math 152 Mock Final ©2006 PLU**

1. Do the first step for each:

a.  $\int \frac{3x}{x^2-1} dx =$

b.  $\int x^2 \cdot e^x dx =$

c.  $\int_0^4 \sqrt{16-x^2} dx =$

d.  $\int \tan^2 x dx =$

2. Find the first 4 terms of the Taylor series for  $f(x) = x^{1.5}$  at  $a = 1$ .

3. The function  $\cos x$  has Taylor series  $\cos x = \sum_{n=0}^{\infty} \frac{(-1)^n}{(2n)!} x^{2n}$ . Consider  $\int_0^{0.9} \cos(\sqrt{x}) dx$ .

a. Use a  $3^{rd}$  degree Taylor polynomial to estimate the integral.

b. Estimate the integral by using the Trapezoid Rule with  $n = 3$ .

4. Find the interval of convergence for the power series  $\sum_{n=1}^{\infty} 4^n \cdot (x-3)^n$

5. Solve the differential equation  $\frac{dP}{dt} = \frac{P}{\sqrt{t}}$  given that  $P(0) = e$ .

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