

EXAM 2
Math 132
August 3, 2007

Name _____

1. Find each of the following integrals, if they exist. If they do not exist, show why not. Note:

$$\int \sec^3(x) dx = \frac{1}{2} \sec(x) \tan(x) + \frac{1}{2} \ln(|\sec(x) + \tan(x)|) + C.$$

(a) $\int \cos^2(x) \sin^3(x) dx$

(b) $\int_0^1 \frac{2x+1}{x^2+x-2} dx$

(c) $\int_3^5 \sqrt{x^2+9} dx$

(d) $\int \sec^2(x) \tan^3(x) dx$

(e) $\int \frac{x^2}{\sqrt{4-x^2}} dx$

(f) $\int_0^{\infty} xe^x dx$

2. Find the partial fraction decomposition for the expression $\frac{2x+3}{x^2+2x+1}$

3. Does the sequence $a_n = \frac{3n^2+1}{5n^2-8}$ converge or diverge? If it converges what does it converge to?

4. For each of the following series show whether or not the series converges or diverges. If a series converges, and if it is possible to do so, find the exact sum of the series.

(a)
$$\sum_{n=1}^{\infty} \frac{\ln(n)}{n}$$

(b)
$$\sum_{n=0}^{\infty} \frac{1}{3} \left(\frac{-7}{8} \right)^n$$

(c)
$$\sum_{n=1}^{\infty} \frac{(-1)^{n-1} 2^n}{n^2}$$

$$(d) \sum_{n=1}^{\infty} \frac{3^n}{(2n)!}$$

$$(e) \sum_{n=1}^{\infty} \frac{\sqrt{n-1}}{n^2+3}$$

5. Does the series $\sum_{n=1}^{\infty} \frac{(-1)^n}{n\sqrt{n}}$ converge conditionally? Does it converge absolutely?