Math 2320 - Test 2

Name:

1. $\displaystyle \int \frac{1}{(3-x^2)^{3/2}} \, dx$

2. $\displaystyle\int \frac{3x + 6}{x^2 + 2x - 8}\, dx$

3. $\displaystyle\int_{-\infty}^{\infty} xe^{-x^2} \, dx$

4. For the following determine if the series converges or diverges. State
the test you used, the criteria satisfired your conclusion and as always
show your work.

(a) $\displaystyle\sum_{n=1}^{\infty} \frac{1}{n+1} - \frac{1}{n+3}$

(b) $\displaystyle\sum_{n=2}^{\infty} \frac{1}{3^n}$

(c) $\displaystyle\sum_{n=4}^{\infty}\left(1+\frac{4}{n}\right)^{n}$

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

(e) $\displaystyle\sum_{n=1}^{\infty} \frac{2^n}{n!}$.

(f) $\displaystyle\sum_{n=1}^{\infty} \frac{n!}{n^n}$.

(g) $\displaystyle\sum_{n=1}^{\infty} \left(\frac{5n+2}{4n-1}\right)^n$.

(h) $\displaystyle\sum_{n=1}^{\infty} \left(1 - \frac{1}{n}\right)^{n^2}$.

(i) $\displaystyle\sum_{n=1}^{\infty} \frac{\sqrt{n+1}}{n^2+2}$.

(j) $\displaystyle\sum_{n=1}^{\infty}(-1)^n \frac{4\sqrt{n^2+2}}{n^2+1}$.