I cobbled this together from a couple different semester which is why the numbering of the problems is off. Solutions coming soon.

I. DETERMINE THE CONVERGENCE OR DIVERGENCE OF EACH SERIES. ALSO:
(A) STATE THE NAME OF THE TEST YOU USE
(B) IF A SERIES IS EITHER GEOMETRIC OR TELESCOPING, AND IT CONVERGES, FIND THE SUM OF THE SERIES.

1. $\sum_{n=1}^{\infty} 8(-.25)^{n-1}$

2. $\sum_{n=1}^{\infty} \frac{n-2}{n^5+n^3-1}$

3. $\sum_{n=1}^{\infty} \left(\frac{2}{2n-3} - \frac{2}{2n-1}\right)$

4. $\sum_{n=1}^{\infty} \frac{(-1)^n (n-3)}{(n+1)!}$

5. $\sum_{n=0}^{\infty} \frac{(-1)^{n+1}(2\pi)^n}{(2n)!}$

6. $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}\left[3 \cdot 5 \cdot 7 \cdot \ldots \cdot (2n+1)\right]}{(2n)!}$

I. DETERMINE THE CONVERGENCE OR DIVERGENCE OF EACH SERIES. ALSO:
(A) STATE THE NAME OF THE TEST YOU USE
(B) IF A CONVERGENT SERIES IS EITHER GEOMETRIC OR TELESCOPING, FIND THE SUM OF THE SERIES.

1. $\sum_{n=1}^{\infty} \left(\frac{n^2}{n^2-3} - \frac{(n+1)^2}{n^2+2n-2}\right)$

2. $\sum_{n=1}^{\infty} \frac{n^2-2}{n^4+4}$

3. $\sum_{n=0}^{\infty} 5(\pi-3)^n$

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

5. $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}\left[2 \cdot 5 \cdot 8 \cdot \ldots \cdot (3n-1)\right]}{n!}$

II. FIND THE INTERVAL OF CONVERGENCE FOR EACH SERIES.

6. $\sum_{n=0}^{\infty} \frac{(-1)^n (x-2)^n}{(2n)!}$

7. $\sum_{n=1}^{\infty} \frac{(-1)^{n+1}(x+1)^n}{n+5}$

III. GIVEN THAT $\cos(x) = \sum_{n=0}^{\infty} \frac{(-1)^{n+1}(2x)^n}{(2n)!}$

8. USE THE **FIRST THREE TERMS** OF THE POWER SERIES EXPANSION OF THE INTEGRAL TO FIND AN APPROXIMATION FOR $\int_0^1 \cos(x^{\frac{1}{2}})dx$.