



### SOME REVIEW PROBLEMS

Determine whether the sequence  $(a_n)$  converges or diverges. Justify your solution using either the Limit Laws, the Squeeze Theorem, or the Monotonic+Bounded Theorem. If possible, try to determine the limit. If possible, try to obtain your solution via several approaches.

1.

$$a_n = \frac{2 + n^3}{1 + 2n^3}$$

2.

$$a_n = \frac{(-11)^n}{n!}$$

3.

$$a_n = \frac{n!}{(3n)!}$$

Determine whether the series  $\sum_{n=1}^{\infty} a_n$  converges or diverges. Justify your solution using an appropriate Test of Convergence/Divergence. If possible, try to determine the limit. If possible, try to obtain your solution via several approaches.

1.

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

2.

$$a_n = \frac{n^{2n}}{(1 + 2n^2)^n}$$

3.

$$a_n = \frac{(-2)^{n-1}}{2^{3n}}$$

4.

$$a_n = \frac{\sqrt{n^4 + 4}}{n^2 + 2}$$

5.

$$a_n = \frac{n^3}{(2n)!}$$

6.

$$a_n = \frac{1 \cdot 3 \cdot 5 \cdots (2n-1)}{n!}$$

Determine which of the above series are conditionally convergent or absolutely convergent.