

- 1) Find a general form, using summation notation, for the series

$$\frac{3}{1 \times 2} - \frac{5}{2 \times 3} + \frac{7}{3 \times 4} - \frac{9}{4 \times 5} + \dots \quad (1)$$

- 2) Find a general form, using summation notation, for the series

$$125 - 25 + 5 - 1 + \dots \quad (2)$$

- 3) Find a general form, using summation notation, for the series

$$\frac{10}{3} + \frac{13}{3} + \frac{16}{3} \dots \quad (3)$$

- 4) Find a general form, using summation notation, for the series. If this is a geometric series, find the sum.

$$4 + 2 + 1 + \frac{1}{2} + \dots \quad (4)$$

- 5) Find a general form, using summation notation, for the series. If this is a geometric series, find the sum.

$$3 + \frac{1}{2} + \frac{1}{12} + \frac{1}{72} + \frac{1}{432} + \dots \quad (5)$$

- 6) Find the limit of the given sequence as $n \rightarrow \infty$

$$\frac{n^2 + 5n^3}{2n^3 + 3\sqrt{4 + n^6}} \quad (6)$$

- 7) Find the limit of the given sequence as $n \rightarrow \infty$

$$n \sin\left(\frac{1}{n}\right) \quad (7)$$

- 8) For problems 4 & 5, use Mathematica to check your answers. (Hint: look up the **Sum**[...] function.)

- 9) For problems 6 & 7, use Mathematica to check your answers. (Hint: look up the **Limit**[...] function.)