

Section 1: The general binomial expansion**Exercise level 2**

1. Expand each of the following functions in ascending powers of x up to the term in x^3 . In each case state the values of x for which the expansion is valid.

(i) $\frac{1}{3-x}$

(ii) $\sqrt{4-3x}$

(iii) $\frac{2+x}{2-x}$

(iv) $\sqrt{\frac{1-x}{1-2x}}$

2. (i) Write out the first three terms in the expansion of $\frac{1}{\sqrt{1-2x}}$.

(ii) Show that $\frac{1}{\sqrt{0.8}} = \frac{\sqrt{5}}{2}$.

- (iii) By substituting $x = 0.1$ in your expansion from (i), and using your result from (ii), find an approximate value for $\sqrt{5}$.

- (iv) Find the percentage error in your answer from (iii).