8.5) Binomial estimation

Worked example

a) Find the first four terms of the binomial expansion, in ascending powers of x, of

$$\left(1+\frac{x}{2}\right)^{10}$$

b) Use your expansion to estimate the value of 1.052^{10}, giving your answer to 4 decimal places

Your turn

a) Find the first four terms of the binomial expansion, in ascending powers of x, of

$$\left(1+\frac{x}{4}\right)^{8}$$

b) Use your expansion to estimate the value of 1.025^{8}, giving your answer to 4 decimal places

a) $1+2x+\frac{7}{4}x^2+\frac{7}{8}x^3+\cdots$

b) 1.2184 (4 dp)

Worked example

a) Find the first four terms of the binomial expansion, in ascending powers of x, of

$$\left(1-\frac{x}{2}\right)^8$$

b) Use your expansion to estimate the value of 0.957^8, giving your answer to 4 decimal places

Your turn

a) Find the first four terms of the binomial expansion, in ascending powers of x, of

$$\left(1-\frac{x}{4}\right)^{10}$$

b) Use your expansion to estimate the value of 0.975^{10}, giving your answer to 4 decimal places

a) $1-\frac{5}{2}x+\frac{45}{16}x^2--\frac{15}{8}x^3+\cdots$

b) 0.7763 (4 dp)

Worked example

a) Find the first three terms of the binomial expansion, in ascending powers of x, of

$$\left(5-\frac{x}{7}\right)^6$$

b) Use your expansion to estimate the value of 4.996^9, giving your answer to 4 significant figures

Your turn

a) Find the first three terms of the binomial expansion, in ascending powers of x, of

$$\left(7-\frac{x}{5}\right)^9$$

b) Use your expansion to estimate the value of 6.991^8, giving your answer to 4 significant figures

a) $40353607-\frac{51883209}{5}x+\frac{29647548}{25}x^2+\cdots$

b) 39890000

Worked example

a) Find the first three terms of the binomial expansion, in ascending powers of x, of

$$\left(1-\frac{x}{3}\right)^8$$

b) Use your expansion to estimate the value of 0.96^8, giving your answer to 5 decimal places

Your turn

a) Find the first four terms of the binomial expansion, in ascending powers of x, of

$$\left(1-\frac{x}{4}\right)^8$$

b) Use your expansion to estimate the value of 0.96^8, giving your answer to 5 decimal places

a) $1-2x+\frac{7}{4}x^2-\frac{7}{8}x^3+\cdots$

b) 0.72122