

Binomial Estimation

(a)	(b)	(c)
Use the first four terms in the expansion of $(1 + x)^8$ to find an approximate value for 1.02^8 $(1 + x)^8 = 1 + 8x + 28x^2 + 56x^3 + \dots$ $x = 0.02$ $1.02^8 \approx 1.171648$	Use the first four terms in the expansion of $(1 - x)^{10}$ to find an approximate value for 0.997^{10} $(1 - x)^{10} = 1 - 10x + 45x^2 - 120x^3 + \dots$ $x = 0.003$ $0.997^{10} \approx 0.97040176$	Use the first four terms in the expansion of $(1 + 3x)^7$ to find an approximate value for 1.006^7 $(1 + 3x)^7 = 1 + 21x + 189x^2 + 945x^3 + \dots$ $x = 0.002$ $1.006^7 \approx 1.04276356$
(d)	(e)	(f)
Use the first three terms in the expansion of $\left(2 + \frac{x}{10}\right)^{11}$ to find an approximate value for 2.001^{11} $\left(2 + \frac{x}{10}\right)^{11} = 2048 + \frac{11264}{10}x + \frac{2816}{10}x^2 + \dots$ $x = 0.01$ $2.001^{11} \approx 2059.29216$	Use the first three terms in the expansion of $\left(3 - \frac{x}{5}\right)^9$ to find an approximate value for 2.98^9 $\left(3 - \frac{x}{5}\right)^9 = 19683 - \frac{59049}{5}x + \frac{79732}{25}x^2 - \dots$ $x = 0.1$ $2.98^9 \approx 18533.9128$	Use the first three terms in the expansion of $\left(4 + \frac{3x}{4}\right)^6$ to find an approximate value for 4.015^6 $\left(4 + \frac{3x}{4}\right)^6 = 4096 + 4608x + 2160x^2 + \dots$ $x = 0.02$ $4.015^6 \approx 4189.024$