

General Binomial Expansion Essential Practice



Skill: General binomial expansion of the form $(1 + ax)^n$

Questions

Attempt these questions independently showing full and clear solutions. Check each answer as you go.

1. For each of the following, without performing the expansion, state the values of x for which the expansion formula is valid.

a. $(1 + 3x)^{-3}$

b. $(1 - x)^{\frac{1}{2}}$

c. $\frac{1}{1-3x}$

d. $\frac{1}{\sqrt{1+\frac{x}{4}}}$

2. Expand each of the following in ascending powers of x , up to and including the term in x^3 , also stating the values of x for which the expansion is valid.

a. $\frac{1}{1+x}$

b. $\sqrt[3]{1+x}$

c. $\frac{1}{\sqrt{1+2x}}$

d. $\frac{1}{(1-2x)^2}$

e. $\frac{1}{(1+3x)^2}$

f. $\sqrt{1+4x}$

3. Expand $\frac{1-x}{(1+2x)^3}$ in ascending powers of x up to and including the term in x^4 , stating the values for which the expansion is valid.

4. Expand $\sqrt{\frac{1-x}{1+2x}}$ in ascending powers of x up to and including the term in x^3 . State the values of x for which the expansion is valid.

5.

- a. Expand $\sqrt{\frac{1+x}{1-x}}$ in ascending powers of x up to and including the term in x^3 . State the values of x for which the expansion is valid.
- b. Use your expanded expression and a suitable substitution to find an approximation for $\sqrt{3}$.