

P3 (variant1 and 3)

Q1.

- 9 (i) Express $\frac{4 + 5x - x^2}{(1 - 2x)(2 + x)^2}$ in partial fractions. [5]
- (ii) Hence obtain the expansion of $\frac{4 + 5x - x^2}{(1 - 2x)(2 + x)^2}$ in ascending powers of x , up to and including the term in x^2 . [5]

Q2.

- 1 Expand $\sqrt[3]{1 - 6x}$ in ascending powers of x up to and including the term in x^3 , simplifying the coefficients. [4]

Q3.

- 2 (i) Expand $\frac{1}{\sqrt{1 - 4x}}$ in ascending powers of x , up to and including the term in x^2 , simplifying the coefficients. [3]
- (ii) Hence find the coefficient of x^2 in the expansion of $\frac{1 + 2x}{\sqrt{4 - 16x}}$. [2]

Q4.

- 1 Expand $\frac{1}{\sqrt{4 + 3x}}$ in ascending powers of x , up to and including the term in x^2 , simplifying the coefficients. [4]

Q5.

- 2 Expand $\frac{1 + 3x}{\sqrt{1 + 2x}}$ in ascending powers of x up to and including the term in x^2 , simplifying the coefficients. [4]

Q6.

- 3 Express $\frac{7x^2 - 3x + 2}{x(x^2 + 1)}$ in partial fractions. [5]

Q7.

8 (i) Express $\frac{5x+3}{(x+1)^2(3x+2)}$ in partial fractions. [5]

(ii) Hence obtain the expansion of $\frac{5x+3}{(x+1)^2(3x+2)}$ in ascending powers of x , up to and including the term in x^2 , simplifying the coefficients. [5]

Q8.

8 Let $f(x) = \frac{3x}{(1+x)(1+2x^2)}$.

(i) Express $f(x)$ in partial fractions. [5]

(ii) Hence obtain the expansion of $f(x)$ in ascending powers of x , up to and including the term in x^3 . [5]

Q9.

1 Expand $(1+2x)^{-3}$ in ascending powers of x , up to and including the term in x^2 , simplifying the coefficients. [3]

Q10.

1 Expand $\frac{16}{(2+x)^2}$ in ascending powers of x , up to and including the term in x^2 , simplifying the coefficients. [4]

Q11.

4 When $(1+ax)^{-2}$, where a is a positive constant, is expanded in ascending powers of x , the coefficients of x and x^3 are equal.

(i) Find the exact value of a . [4]

(ii) When a has this value, obtain the expansion up to and including the term in x^2 , simplifying the coefficients. [3]

Q12.

9 (i) Express $\frac{9-7x+8x^2}{(3-x)(1+x^2)}$ in partial fractions. [5]

(ii) Hence obtain the expansion of $\frac{9-7x+8x^2}{(3-x)(1+x^2)}$ in ascending powers of x , up to and including the term in x^3 . [5]

Q13.

7 Let $f(x) = \frac{2x^2 - 7x - 1}{(x - 2)(x^2 + 3)}$.

(i) Express $f(x)$ in partial fractions. [5]

(ii) Hence obtain the expansion of $f(x)$ in ascending powers of x , up to and including the term in x^2 . [5]

Q14.

8 (i) Express $\frac{7x^2 + 8}{(1 + x)^2(2 - 3x)}$ in partial fractions. [5]

(ii) Hence expand $\frac{7x^2 + 8}{(1 + x)^2(2 - 3x)}$ in ascending powers of x up to and including the term in x^2 , simplifying the coefficients. [5]

Q15.

9 (i) Express $\frac{4 + 12x + x^2}{(3 - x)(1 + 2x)^2}$ in partial fractions. [5]

(ii) Hence obtain the expansion of $\frac{4 + 12x + x^2}{(3 - x)(1 + 2x)^2}$ in ascending powers of x , up to and including the term in x^2 . [5]

Q16.

2 Expand $(1 + 3x)^{-\frac{1}{3}}$ in ascending powers of x , up to and including the term in x^3 , simplifying the coefficients. [4]

Q17.

9 Let $f(x) = \frac{x^2 - 8x + 9}{(1 - x)(2 - x)^2}$.

(i) Express $f(x)$ in partial fractions. [5]

(ii) Hence obtain the expansion of $f(x)$ in ascending powers of x , up to and including the term in x^2 . [5]

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