

10 Let $f(x) = \frac{x^2 + 2x - 11}{(3+x)(2+x^2)}$.

- (a) Express $f(x)$ in partial fractions.

[6]

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

[5]

- 1 (a) Sketch the graph of $y = |2x - 3|$. [1]

[1]

- (b) Solve the inequality $3x-1 < |2x-3|$. [2]

[2]

- 5 The polynomial $3x^3 + pax^2 + 7a^2x + qa^3$ is denoted by $f(x)$, where p, q and a are constants and $a \neq 0$.

When $f(x)$ is divided by $(x+2a)$ the remainder is $-22a^3$. When $f(x)$ is divided by $(3x-a)$ the remainder is $-a^3$.

Find the values of p and q . [5]

[illegible]

- [3]

[illegible]

- $$\frac{dy}{dx} = \frac{x^3 + 5x^2 - 2x - 15}{6y(x^2 - 3)}.$$

Solve the differential equation to obtain an expression for y^2 in terms of x . [5]

[illegible][illegible]

- 2 (a) Expand $(6-x)(1-2x)^{-\frac{5}{2}}$ in ascending powers of x , up to and including the term in x^2 , simplifying the coefficients. [4]

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- [1]

[illegible]

- 10 (a)** Find the quotient and remainder when x^2 is divided by $1 + 4x^2$. [2]

[illegible]

- (b) Find the exact value of $\int_0^{0.5} x \tan^{-1}(2x) dx$. [6]

[illegible]

