

Partial Fractions

$$1) \frac{3x - 1}{(x + 3)(x - 2)}$$

$$2) \frac{5x + 6}{(x + 4)(x - 3)}$$

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

$$4) \frac{9 - 8x}{(2x - 1)(3 - x)}$$

$$5) \frac{7x + 16}{x^2 + 2x - 8}$$

$$6) \frac{5x - 1}{2x^2 + x - 10}$$

$$7) \frac{4x}{x^2 - 9}$$

$$8) \frac{2x - 7}{x^2 - x - 2}$$

$$9) \frac{2}{(x + 3)(x + 2)(x + 1)}$$


$$10) \frac{x^2 - 9x + 2}{(x+1)(x-1)(x-2)}$$

$$11) \frac{x+1}{(x+3)(x+2)(x-1)}$$

$$12) \frac{2x^2 - 7x + 1}{(2x+1)(2x-1)(x-2)}$$

$$13) \frac{7x^2 + 39x + 56}{(x+4)(x+3)(2x+5)}$$

$$14) \frac{2x^2 + 11x + 3}{x(3x+1)(x+3)}$$

15) a) Express each of the following in partial fractions.

$$\text{i)} \frac{x-8}{(x-2)(x-4)} \quad \text{ii)} \frac{12}{(x-2)(x-4)}$$

b) Hence prove that

$$\frac{(x-8)^2}{(x-2)^2(x-4)^2} \equiv \frac{9}{(x-2)^2} + \frac{4}{(x-4)^2} + \frac{6}{x-2} - \frac{6}{x-4}$$

16) a) Express each of the following in partial fractions.

$$\text{i)} \frac{3x + 13}{(x + 3)(x + 1)} \quad \text{ii)} \frac{2}{(x + 3)(x + 1)}$$

b) Hence prove that

$$\frac{(3x + 13)^2}{(x + 3)^2(x + 1)^2} \equiv \frac{4}{(x + 3)^2} + \frac{25}{(x + 1)^2} + \frac{10}{x + 3} - \frac{10}{x + 1}$$

Answers

$$1) \frac{2}{x+3} + \frac{1}{x-2}$$

$$2) \frac{2}{x+4} + \frac{3}{x-3}$$

$$3) \frac{3}{x+2} - \frac{1}{x+1}$$

$$4) \frac{2}{2x-1} - \frac{3}{3-x}$$

$$5) \frac{2}{x+4} + \frac{5}{x-2}$$

$$6) \frac{3}{2x+5} + \frac{1}{x-2}$$

$$7) \frac{2}{x+3} + \frac{2}{x-3}$$

$$8) \frac{3}{x+1} - \frac{1}{x-2}$$

$$9) \frac{1}{x+3} - \frac{2}{x+2} + \frac{1}{x+1}$$

$$10) \frac{2}{x+1} + \frac{3}{x-1} - \frac{4}{x-2}$$

$$11) \frac{1}{3(x+2)} + \frac{1}{6(x-1)} - \frac{1}{2(x+3)}$$

$$12) \frac{1}{2x+1} + \frac{2}{3(2x-1)} - \frac{1}{3(x-2)}$$

$$13) \frac{4}{x+4} - \frac{2}{x+3} + \frac{3}{2x+5}$$

$$14) \frac{1}{x} - \frac{1}{2(x+3)} + \frac{1}{2(3x+1)}$$

$$15) \text{ i) } \frac{6}{x-4} - \frac{6}{x-2}$$

$$16) \text{ ii) } \frac{5}{x+1} - \frac{2}{x+3} \quad \text{ iii) } \frac{1}{x+1} - \frac{1}{x+3}$$

