

Section A: Linear Factors (Basic)

1. Decompose:

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

2. Decompose:

$$\frac{7x - 7}{(x - 3)(x + 4)}$$

3. Decompose:

$$\frac{4x + 5}{(x + 2)(x - 1)}$$

Section B: Repeated Factors

4. Decompose:

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

5. Decompose:

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

6. Decompose:

$$\frac{3x + 7}{(x + 3)^2}$$

Section C: Mixed Factors (Linear and Repeated)

7. Decompose:

$$\frac{4x^2 + 2x + 6}{(x + 2)(x - 1)^2}$$

8. Decompose:

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

Section D: Irreducible Quadratic Factors

9. Decompose:

$$\frac{3x^2 + 4x + 2}{(x + 1)(x^2 + 2x + 2)}$$

10. Decompose:

$$\frac{5x^2 + 7x + 3}{(x + 1)(x^2 + x + 1)}$$

Challenge Section

11. Decompose:

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

12. Decompose:

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