

TU 152 Partial Fraction Decomposition

Find the partial fraction decomposition of the following function:

$$1. \frac{2x^2 + 6x - 2}{x^3 + x^2 - 2x}$$

$$2. \frac{2x^3 + 3x - 1}{x^4 - x^3 + x^2 - x}$$

$$3. \frac{-3x^2 - 7x - 2}{x^3 + 5x^2 + 7x + 3}$$

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

$$5. \frac{2x^3 + 3x^2 + 2}{x^2 + x}$$

$$6. \frac{x^5 + 2x^4 + x^3 + 3x^2 - 1}{x^4 + x^2}$$

$$7. \frac{2x^3 - 10x^2 - x - 18}{x^3 - 4x^2 + 2x - 8}$$

$$8. \frac{x^4 - 4x^3 + 4x^2 - 2x + 7}{x^2 - 4x + 4}$$

$$9. \frac{x^4 + x^3 - 5x^2 - 3x - 12}{x^4 - 2x^3 + 3x^2 - 6x}$$

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

$$11. \frac{x^4 + x^2 - 5x + 3}{x^4 + 3x^2 - 4}$$

Solutions

$$1. \quad \frac{1}{x} + \frac{2}{x-1} - \frac{1}{x+2}$$

$$2. \quad \frac{-x}{x^2+1} + \frac{2}{x-1} + \frac{1}{x}$$

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

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

$$5. \quad 2x + 1 + \frac{2}{x} - \frac{3}{x+1}$$

$$6. \quad x+2 + \frac{2}{x^2+1} - \frac{1}{x^2}$$

$$7. \quad 2 + \frac{x-1}{x^2+2} - \frac{3}{x-4}$$

$$8. \quad x^2 - \frac{2}{x-2} + \frac{3}{(x-2)^2}$$

$$9. \quad 1 + \frac{2x}{x^2+3} - \frac{1}{x-2} + \frac{2}{x}$$

$$10. \quad \frac{3x}{2x^2-x+1} - \frac{1}{x} - x$$

$$11. \quad 1 - \frac{1}{x+1} + \frac{x-3}{x^2+4}$$