

Fraction Decomp Study Problems

Date _____ Period _____

Find the partial fraction decomposition of each. #'s 1-4 have 2 distinct linear factors. #'s 5-6 have 3 distinct linear factors. #'s 7-8 have 1 pair of repeated factors (perfect squares). #'s 9-10 have 1 distinct linear factor and 1 pair of repeated factors. #'s 11-12 require long division. #'s 13-16 have one linear factor and one non-factorable quadratic factor (requires the constant A and the linear term Ax + B).

1) $\frac{-6x - 15}{x^2 + 5x}$

2) $\frac{9x - 33}{x^2 - 6x + 5}$

3) $\frac{8x + 22}{x^2 + 5x + 6}$

4) $\frac{-4x - 8}{3x^2 + 16x + 16}$

$$5) \frac{-8x^2 - 50x - 60}{x^3 + 9x^2 + 20x}$$

$$6) \frac{3x^2 - 21x + 24}{x^3 - 5x^2 + 4x}$$

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

$$8) \frac{5x - 23}{x^2 - 10x + 25}$$

$$9) \frac{7x^2 - 55x + 125}{x^3 - 10x^2 + 25x}$$

$$10) \frac{-x^2 + 9x + 80}{x^3 + 8x^2 + 16x}$$

$$11) \frac{2x^3 - 3x^2 - 29x}{x^3 - 16 - 12x}$$

$$12) \frac{x^3 - 36 - 16x}{x^3 + 6x^2 + 9x}$$

$$13) \frac{x^2 + 1 + 4x}{x^3 + x}$$

$$14) \frac{x^2 - 5 + 5x}{x^3 - 5x}$$

$$15) \frac{4x^2 - 8 + 3x}{x^3 - 2x}$$

$$16) \frac{4x^2 + 12 + 5x}{x^3 + 3x}$$

Answers to Fraction Decomp Study Problems (ID: 1)

- 1) $-\frac{3}{x} - \frac{3}{x+5}$ 2) $\frac{6}{x-1} + \frac{3}{x-5}$ 3) $\frac{6}{x+2} + \frac{2}{x+3}$ 4) $-\frac{1}{x+4} - \frac{1}{3x+4}$
- 5) $-\frac{3}{x} - \frac{2}{x+5} - \frac{3}{x+4}$ 6) $\frac{6}{x} - \frac{2}{x-1} - \frac{1}{x-4}$ 7) $-\frac{2}{x-2} - \frac{2}{(x-2)^2}$ 8) $\frac{5}{x-5} + \frac{2}{(x-5)^2}$
- 9) $\frac{5}{x} + \frac{2}{x-5} + \frac{5}{(x-5)^2}$ 10) $\frac{5}{x} - \frac{6}{x+4} - \frac{7}{(x+4)^2}$ 11) $2 - \frac{1}{x-4} - \frac{2}{x+2} - \frac{5}{(x+2)^2}$
- 12) $1 - \frac{4}{x} - \frac{2}{x+3} + \frac{5}{(x+3)^2}$ 13) $\frac{1}{x} + \frac{4}{x^2+1}$ 14) $\frac{1}{x} + \frac{5}{x^2-5}$
- 15) $\frac{4}{x} + \frac{3}{x^2-2}$ 16) $\frac{4}{x} + \frac{5}{x^2+3}$