Practice Problems: Partial Fraction Decomposition

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This is a list of practice problems for Math 3B. Feel free to work with a group on any problem. These problems are intended to enhance your knowledge and give you something to bring a boring party back to life.

For the following problems, just find the partial fraction decomposition (no need to integrate).

1. $\dfrac{3x}{2x^2 - x - 1}$

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

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

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

5. $\dfrac{x^5 - 3x^2 + 12x - 1}{x^3(x^2 + x + 1)(x^2 + 2)^3}$ (Just write out the form, do not find the constants here.)

6. $\dfrac{2x^4 + 4x^3 - 2x^2 + x + 7}{x^3 + 2x^2 - x - 2}$

7. $\dfrac{12}{x^2 - 9}$

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

9. $\dfrac{x - 4}{(2x - 5)^2}$

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

11. $\dfrac{x - 3}{x^3 + 3x}$

12. $\dfrac{2x^3 + 7x + 5}{(x^2 + x + 2)(x^2 + 1)}$

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