

Partial Fraction Worksheet

Express each of these fractions as the sum of two or more fractions with simpler denominators.

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

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

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

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

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

11. $\frac{\cos x}{\sin x(\sin x - 1)}$

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

12. $\frac{\sec^2 x}{\tan^2 x + \tan x}$

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

13. $\frac{e^x}{e^{2x} - 1}$

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

14. $\frac{e^x}{e^{2x} + e^x}$

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

15. $\frac{1}{e^{2x} - 1}$

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

EXERCISES Find the indefinite integral.

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

2. $\int \frac{x}{x^2+7+10} dx$

3. $\int \frac{6}{3x^2-14x+8} dx$

4. $\int \frac{3x^2+8x-7}{(x+4)(x+3)(x+1)} dx$

5. $\int \frac{2-4x^2}{(x+2)(x-2)(x-5)} dx$

6. $\int \frac{3x}{(x+4)(x-1)(x-3)} dx$

7. $\int \frac{3-2x}{x^2+6x+9} dx$

8. $\int \frac{3x-1}{x^3-2x^2} dx$

9. $\int \frac{2x^2+x+4}{(x+1)(x-4)^2} dx$

10. $\int \frac{5x^2+8x+6}{(x+4)(x^2+2)} dx$

11. $\int \frac{12x+18}{(x+3)(2x^2+8x+9)} dx$

12. $\int \frac{15-25x}{(x-4)(2x^2-6x+9)} dx$

EXERCISES Find the indefinite integral.

1. $\int \frac{6x+5}{x+2} dx$

2. $\int \frac{4x^2-12x-25}{x-5} dx$

3. $\int \frac{5x^3+3x-2}{x-1} dx$

4. $\int \frac{x^3+3x^2-4x-6}{x^2+2x-15} dx$

5. $\int \frac{4x^2-8x+3}{x^2-3x-4} dx$

6. $\int \frac{x^3-3x^2}{x^2-3x-10} dx$

7. $\int \frac{4x^3+20x^2+15x+8}{x^3+5x^2+4x} dx$

8. $\int \frac{x^4-10x^3+28x^2-15x-15}{x^3-7x^2+10x} dx$