



1 Evaluate the following integrals.

a.

$$\int \frac{2x}{x+4} dx$$

b.

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

c.

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

2 Find the partial fraction decomposition of the following integrals. When you have found an answer; check that your solution is correct by adding all the parts of the partial fraction decomposition together again.

a.

$$f(x) = -\frac{4x-3}{(x-2)(2x+1)}$$

b.

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

c.

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

3 Evaluate the following integrals by using the partial fraction decompositions obtained in the previous exercise

a.

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

b.

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

c.

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

4 Evaluate the following integrals

a.

$$\int \frac{2x^2 + 5x + 11}{(x+2)^2(x-1)} dx$$

b.

$$\int \frac{1}{(x-2)(x+1)} dx$$

c.

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

5 Evaluate the following integrals

a.

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

b.

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

c.

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