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MA0002 Brukerkurs i
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Exercise set 2

1 Evaluate the following integrals.

a.
$$\int \frac{x}{x+3}\,\mathrm{d}x$$

b.
$$\int \frac{-x^2 + 4x + 1}{x - 1}\,\mathrm{d}x$$

c.
$$\int \frac{3x^3 + 5x - 2x^2 - 2}{x^2 + 1}\,\mathrm{d}x$$

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

b.
$$g(x) = \frac{16x - 6}{(2x - 5)(3x + 1)}$$

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

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

a.
$$\int -\frac{x+1}{(2x+1)(x-1)}\,\mathrm{d}x$$

b.
$$\int \frac{16x - 6}{(2x - 5)(3x + 1)}\,\mathrm{d}x$$

c.
$$\int = \frac{1}{x(x+1)^2}\,\mathrm{d}x$$

4 Evaluate the following integrals

a.
$$\int \frac{4x^2 - x - 1}{(x+1)^2(x-3)} \, \mathrm{d}x$$

b.
$$\int \frac{1}{(x-1)(x+2)} \, \mathrm{d}x$$

c.
$$\int \frac{2x+1}{x^3 + 3x^2} \, \mathrm{d}x$$

5 Evaluate the following integrals

a.
$$\int \frac{2x^2 - 3x + 2}{(x^2+1)^2} \, \mathrm{d}x$$

b.
$$\int \frac{x^3 - x^2 + x - 4}{(x^2+1)(x^2+4)} \, \mathrm{d}x$$

c.
$$\int \frac{1}{x^2(1+x^2)} \, \mathrm{d}x$$