

## MCS 119, Calculus

### Worksheet on integrals

1. Find the following integrals. Note that you can check your work by differentiating.

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

$$(b) \int (2x - 1)(x + 2) dx$$

$$(c) \int \frac{3x + 5 - \sqrt{x}}{x^4} dx$$

$$(d) \int \sqrt{x^2 + 2x + 1} dx$$

2. Find the following integrals. You can use the Fundamental Theorem, but note that the integrals may be easier to find by sketching a graph of the integrand and using the area definition of a definite integral.

$$(a) \int_{-1}^1 x^3 + 3x - 2 dx$$

$$(b) \int_{-1}^1 x^3 + 3x dx$$

$$(c) \int_{-1}^1 \sqrt{1 - x^2} dx$$

3. Find the following integrals. Note that you can check your work by differentiating.

(a)  $\int (2x - 1)(x^2 - x + 4)^5 dx$

(b)  $\int 2x\sqrt{x^2 + 1} dx$

(c)  $\int \frac{(x + 1)}{\sqrt{x^2 + 2x + 12}} dx$

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

(e)  $\int \frac{-1}{(x + 1)^7} dx$

(f)  $\int \frac{\sqrt{x} - x^3 + x + 12}{\sqrt{x}} dx$