

Part 7

Integrals

Question 7.1. Find the integral.

$$\int (2x^3 - 5x + 7) dx$$

Question 7.2. Find the integral.

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

Question 7.3. Find the integral.

$$\int \left(\frac{\sqrt{x}}{2} + \frac{2}{\sqrt{x}} \right) dx$$

Question 7.4. Find the integral.

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

Question 7.5. Find the integral.

$$\int \frac{t\sqrt{t} + \sqrt{t}}{t^2} dt$$

Question 7.6. Find the integral.

$$\int (4 \sec x \tan x - 2 \sec^2 x) dx$$

Question 7.7. Find the integral.

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

Question 7.8. Find the integral.

$$\int \left(\frac{2}{\sqrt{1-y^2}} - \frac{1}{y^{1/4}} \right) dy$$

Question 7.9. Find the integral.

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

Question 7.10. Find the integral.

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

Question 7.11. Find the integral.

$$\int \frac{(1 + \sqrt{x})^{1/3}}{\sqrt{x}} dx$$

Question 7.12. Find the integral.

$$\int \sin 3x \, dx$$

Question 7.13. Find the integral.

$$\int \frac{1}{\sqrt{5x+8}} dx$$

Question 7.14. Find the integral.

$$\int \sec^2(3x + 2) dx$$

Question 7.15. Find the integral.

$$\int (\cos x) e^{\sin x} dx$$

Question 7.16. Find the integral.

$$\int \frac{1}{x \ln x} dx$$

Question 7.17. A rocket lifts off the surface of Earth with a constant acceleration of 20 m/sec^2 . How fast will the rocket be going 1 minute later?

Question 7.18. A particle moves on a coordinate line with acceleration $a = d^2s/dt^2 = 15\sqrt{t} - (3/\sqrt{t})$, subject to the conditions that $ds/dt = 4$ and $s = 0$ when $t = 1$.

- (a) Find the velocity $v = ds/dt$ in terms of t .
- (b) Find the position s in terms of t .