

- Definite integrals

Evaluate each definite integral.

1) $\int_0^4 (x^3 - 4x^2 + 5) dx$

2) $\int_{-\frac{\pi}{4}}^{\frac{\pi}{4}} 2\sec^2 x dx$

3) $\int_2^5 \frac{2}{x+3} dx$

4) $\int_{-1}^0 3e^x dx$

5) $\int_1^2 -\frac{4}{x^2} dx$

6) $\int_{\frac{2\sqrt{3}}{3}}^2 \frac{1}{x\sqrt{x^2-1}} dx$

7) $\int_{\frac{\sqrt{2}}{2}}^{\frac{\sqrt{3}}{2}} \frac{1}{\sqrt{1-x^2}} dx$

8) $\int_1^4 \left(-\frac{x^2}{2} + 4x - 10\right) dx$

9) $\int_{-1}^1 e^{-2x} dx$

10) $\int_{-\pi}^{-\frac{\pi}{4}} -2\sin x dx$

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

12) $\int_{\frac{\sqrt{3}}{3}}^{\sqrt{3}} \frac{1}{1+x^2} dx$

13) $\int_{\frac{\pi}{3}}^{\frac{2\pi}{3}} \csc x \cot x dx$

14) $\int_1^8 -5x^{\frac{2}{3}} dx$

15) $\int_1^9 \frac{2}{\sqrt{x}} dx$

16) $\int_{-\frac{\pi}{2}}^{\frac{\pi}{3}} 6\cos x dx$

Substitution for Definite Integrals

Express each definite integral in terms of u , but do not evaluate.

1) $\int_{-1}^0 \frac{8x}{(4x^2 + 1)^2} dx; u = 4x^2 + 1$

2) $\int_0^1 -12x^2(4x^3 - 1)^3 dx; u = 4x^3 - 1$

3) $\int_{-1}^2 6x(x^2 - 1)^2 dx; u = x^2 - 1$

4) $\int_0^1 \frac{24x}{(4x^2 + 4)^2} dx; u = 4x^2 + 4$

Evaluate each definite integral.

5) $\int_{-3}^0 -\frac{8x}{(2x^2 + 3)^2} dx; u = 2x^2 + 3$

6) $\int_0^1 \frac{16x}{(4x^2 + 4)^2} dx; u = 4x^2 + 4$

7) $\int_{-1}^0 18x^2(3x^3 + 3)^2 dx; u = 3x^3 + 3$

8) $\int_0^1 -\frac{8x}{(4x^2 + 2)^2} dx; u = 4x^2 + 2$