

Substitution for Definite Integrals

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

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

$$\int_5^1 \frac{1}{u^2} du$$

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

$$\int_{-1}^3 -u^3 du$$

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

$$\int_0^3 3u^2 du$$

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

$$\int_4^8 \frac{3}{u^2} du$$

Evaluate each definite integral.

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

$$\frac{4}{7} \approx 0.571$$

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

$$\frac{1}{4} = 0.25$$

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

$$18$$

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

$$-\frac{1}{3} \approx -0.333$$