

Assignment - Integration (Substitution)

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

1) $\int_{-1}^0 -6x(3x^2 + 2)^2 dx; u = 3x^2 + 2$

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

Evaluate each indefinite integral.

3) $\int -\frac{30x}{3x^2 - 1} dx$

4) $\int \frac{2x}{x^2 - 3} dx$

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

5) $\int_{-1}^2 -\frac{12x}{(3x^2 + 3)^2} dx; u = 3x^2 + 3$

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

Evaluate each indefinite integral.

7) $\int \frac{27x^2}{3x^3 + 5} dx$

8) $\int \frac{24x^3}{3x^4 + 2} dx$

9) $\int (4x^3 + 1)^5 \cdot 12x^2 dx$

10) $\int 8x(4x^2 - 5)^5 dx$

$$11) \int 4x \sec^2(x^2 + 3) dx$$

$$12) \int 16x \sec^2(4x^2 + 5) dx$$

Answers to Assignment - Integration (Substitution)

$$1) \int_5^2 -u^2 du$$

$$2) \int_6^2 -\frac{1}{u^2} du$$

$$3) -5 \ln |3x^2 - 1| + C \quad 4) \ln |x^2 - 3| + C$$

$$5) \int_6^{15} -\frac{2}{u^2} du$$

$$6) \int_4^2 -\frac{2}{u^2} du$$

$$7) 3 \ln |3x^3 + 5| + C \quad 8) 2 \ln (3x^4 + 2) + C$$

$$9) \frac{1}{6}(4x^3 + 1)^6 + C$$

$$10) \frac{1}{6}(4x^2 - 5)^6 + C$$

$$11) 2 \tan (x^2 + 3) + C \quad 12) 2 \tan (4x^2 + 5) + C$$