

Use substitution to integrate the indefinite and definite integrals.

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

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

3)  $\int xe^{x^2} dx$

4)  $\int x(x^2 + 1)^{17} dx$

5)  $\int \frac{4x}{\sqrt{x^2 + 2}} dx$

6)  $\int (2 + 2x)e^{(4x + 2x^2)} dx$

7)  $\int \frac{(\ln x)^5}{x} dx$

8)  $\int 4x^5(x^6 + 100)^5 dx$

9)  $\int 8t\sqrt{4t^2 - 9} dt$

10)  $\int_0^3 \frac{1}{3x - 1} dx$

11)  $\int_0^2 \frac{x^2}{(5 + 2x^3)^2} dx$

12)  $\int_1^4 \frac{2 \ln x^2}{x} dx$

## Answer Key

### Testname: PRACTICE ON SUBSTITUTION

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

$$2) \frac{1}{2} \ln |4x^2 + 2x + 3| + C$$

$$3) \frac{1}{2}e^{x^2} + C$$

$$4) \frac{1}{36}(x^2 + 1)^{18} + C$$

$$5) 4\sqrt{x^2 + 2} + C$$

$$6) \frac{1}{2}e^{(4x + 2x^2)} + C$$

$$7) \frac{1}{6}(\ln x)^6 + C$$

$$8) \frac{1}{9}(x^6 + 100)^6 + C$$

$$9) \frac{3(4t^2 - 9)^{4/3}}{4} + C$$

$$10) \frac{1}{3} \ln 8 \approx 0.69$$

$$11) \frac{8}{315}$$

$$12) \frac{(\ln 16)^2}{2} \approx 3.84$$