

Find the general antiderivative.

1.  $\int \left( 6t^3 - 7t^2 - \frac{1}{t} \right) dt$

2.  $\int \sqrt{3x + 5} dx$

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

4.  $\int (e^{2x} - 2^x) dx$

5.  $\int (3t - 5)^{1.8} dt$

6.  $\frac{d}{dx} \left( \int \frac{dv}{v^2 + 1} \right)$

7.  $\int \left( \frac{d}{dx} \left( \frac{1}{v^2 + 1} \right) \right) dv$

8.  $\int \left( z\sqrt{z} - \frac{1}{z\sqrt{z}} \right) dz$

Evaluate the following definite integrals.

1.  $\int_2^5 (4x^3 - 3x^2) dx$

2.  $\int_0^2 2e^{3x} dx$

Write a formula for the function that meets the following conditions.

1.  $\frac{dy}{dx} = 6x^2 + 4x, y(2) = 10$

2.  $\frac{dy}{dx} = \frac{6x^2 + 4x}{\sqrt{2x + 3}}, y(2) = 10$