

6.2 addendum

Solve the equation:

$$y' = x^2 y \quad \text{rewrite}$$

$$\frac{dy}{dx} = x^2 y \quad \text{separate}$$

$$\int \frac{dy}{y} = \int x^2 dx \quad \text{integrate}$$

$$\ln|y| + C_1 = \frac{x^3}{3} + C_2$$

$$\ln|y| = \frac{x^3}{3} + C$$

$$e^{\ln|y|} = e^{\frac{x^3}{3} + C}$$

$$e^{\ln|y|} = e^{\frac{x^3}{3}} e^C$$

$$\boxed{y = C e^{\frac{x^3}{3}}}$$

combine
constants

"e" raised to the
power of each
side.

use
log property

Log property:

$$a^{\log_a m} = m \quad \text{with base "e"}$$

$$e^{\log_e m} = m \quad \text{or}$$

$$\boxed{e^{\ln m} = m}$$

Exponent rule:

$$a^{m+n} = a^m a^n$$

e^e is just
another constant