Notes

Examples

Example 1. Find the general solution for the differential equation

$$\frac{dy}{dx} = 14\frac{x^7 + 3}{y^2}.$$

Example 2. Americium-241 is a ubiquitous isotope of Am, and is probably found in your household smoke detector. The half-life of ^{241}Am is 432.2 years. If your smoke detector has 4 micrograms of ^{241}Am when you move into your house, how much will remain when you pay off your 30-year mortgage?

Example 3. Find a particular solution to the given differential equation.

$$\frac{dy}{dx} = 6x^2 e^{5y-x^3}$$

Example 4. You arrive at a crime scene at 6:00 am and discover a body. Crime scene investigators measure the body's temperature to be 27°C upon arrival, and an hour later the body's temperature is 25°C. During this time, the temperature of the room was 22°C. Assuming that the person a temperature of 37°C when living, what was the time of death?

Example 5. Find a particular solution to the differential equation (n is a constant)

$$y' = 6x^n, \qquad y(1) = 3.$$