

Answer on Question #69648 – Math – Differential Equations

Question

1. Solve the differential equation

$$2 \frac{d^2y}{dx^2} + 5 \frac{dy}{dx} - 12y = 0$$

Solution

$$2y'' + 5y' - 12y = 0$$

1. Construct a characteristic equation:

$$2k^2 + 5k - 12 = 0;$$

$$k_1 = -4; k_2 = \frac{3}{2};$$

2. The general solution of the differential equation:

$$y = C_1 e^{-4x} + C_2 e^{\frac{3}{2}x},$$

where C_1 and C_2 are arbitrary real constants.

Answer: $y = C_1 e^{-4x} + C_2 e^{\frac{3}{2}x}$.