

Write on both sides of the paper

Question

in either margin

Example 2:

Solve the ODE

$$x dx - (5y^4 + 3) dy = 0$$

Sol: separating the variables we get:

$$x dx = (5y^4 + 3) dy$$

Integrating both sides:

$$\int x dx = \int (5y^4 + 3) dy$$

$$\frac{x^2}{2} = y^5 + 3y + C$$

$$\frac{1}{2} x^2 = y^5 + 3y + C \quad (\text{implicit form})$$

Example 3: Solve the IVP

$$2x(y+1) \frac{dy}{dx} = 0$$

$$y(0) = -2$$

Sol: separating the variables we get

$$2x(y+1) = y \frac{dy}{dx}$$

$$2x dx = \frac{y}{y+1} dy$$

integrating:

$$\int 2x dx = \int \frac{y}{y+1} dy$$

$$= \int \left(1 - \frac{1}{y+1} \right) dy$$

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