

separable & first order linear differential equations

Find the differential equation that satisfies the given initial condition.

(a)

$$xy' + y = y^2, y(1) = -1$$

(b)

$$\frac{dy}{dt} = \frac{te^t}{y\sqrt{1+y^2}}, y(0) = 0$$

(c)

$$2xy' + y = 6x, x > 0, y(4) = 20$$

(d)

$$(x^2 + 1)\frac{dy}{dx} + 3x(y - 1) = 0, y(0) = 2$$