Date _____ Day M T W T F S

Divide b.s by $y^{\frac{1}{2}}$, we get

$$\frac{dy}{dx} + y = y^{-\frac{1}{2}} \quad \cdots (i)$$

$$h = \frac{-1}{2}$$

$$v = y^{1-n}$$

$$v = y^{1-\left(-\frac{1}{2}\right)}$$

$$v = y^{1+\frac{1}{2}}$$

$$v = y^{\frac{3}{2}}$$

$$y = v^{\frac{2}{3}}$$

$$\frac{dy}{dx} = \frac{2}{3} v^{\frac{1}{3}} \frac{dv}{dx}$$

put in (i)

$$\frac{2}{3} v^{\frac{1}{3}} \frac{dv}{dx} + v^{\frac{2}{3}} = \left(v^{\frac{2}{3}}\right)^{-\frac{1}{2}}$$

$$\frac{2}{3} v^{\frac{1}{3}} \frac{dv}{dx} + v^{\frac{2}{3}} = v^{\frac{1}{3}}$$

Mult by $\frac{3}{2} v^{\frac{1}{3}}$

$$\left(\frac{2}{3} v^{-\frac{1}{3}} \frac{dv}{dx}\right)\left(\frac{3}{2} v^{\frac{1}{3}}\right) + \left(v^{\frac{2}{3}}\right)\left(\frac{3}{2} v^{\frac{1}{3}}\right) = \left(v^{-\frac{1}{3}}\right)\left(\frac{3}{2} v^{\frac{1}{3}}\right)$$

$$\frac{dv}{dx} + \frac{3v}{2} = \frac{3}{2}$$

Date _____ Day M T W T F S

$$1-v = \frac{1}{Ce^{\frac{3}{4}x^2}}$$

$$v = 1 + \frac{1}{Ce^{\frac{3}{4}x^2}}$$

put $v = y^{\frac{3}{2}}$ we get

$$y^{\frac{3}{2}} = 1 + \frac{1}{Ce^{\frac{3}{4}x^2}}$$

$$y = \left(1 + \frac{1}{Ce^{\frac{3}{4}x^2}}\right)^{\frac{2}{3}}$$

$y(0) = 4$

$$4 = \left(1 + \frac{1}{Ce^{\frac{3}{4}(0)^2}}\right)^{\frac{2}{3}}$$

$$4 = \left(1 + \frac{1}{C}\right)^{\frac{2}{3}}$$

$$(4)^{\frac{3}{2}} = 1 + \frac{1}{C}$$

$$8 = 1 + \frac{1}{C}$$

$$8 - 1 = \frac{1}{C}$$

$$7 = \frac{1}{C}$$

$$C = \frac{1}{7}$$

Solution to given IVP is $y = \left(1 + \frac{1}{\frac{1}{7}e^{\frac{3}{4}x^2}}\right)^{\frac{2}{3}}$