

$$\text{a17. } x^2y + x \ln y = 1 \quad ; \quad x_0 = 1; y_0 = 1; y'_x, y'_x(x_0), y''_{xx}(x_0)$$

$$(x^2y + x \ln y)' = 1' \quad ; \quad 2xy + x^2y' + \ln y + \frac{y'}{y} = 0$$

$$x^2y' + \frac{y'}{y} = -2xy - \ln y \quad ; \quad y' \left(x^2 + \frac{x}{y} \right) = -2xy - \ln y$$

$$\left[y'_x = \frac{(-2xy - \ln y) \cdot y}{x(xy + 1)} \quad \middle| \quad y'_x(x_0) = \frac{(-2 \cdot 1 \cdot 1 - \ln 1) \cdot 1}{1(1 \cdot 1 + 1)} = -1 \right]$$

$$y''_{xx} = \left(\frac{-2xy^2 - y \ln y}{x^2y + x} \right)' \quad ; \quad y''_{xx} = \frac{(x^2y + x)(-2xy^2 - y \ln y)' - (-2xy^2 - y \ln y)(x^2y + x)'}{(x^2y + x)^2}$$

$$y''_{xx} = \frac{(x^2y + x)(-2y^2 - 4yy'x - y' \ln y - y \cdot \frac{y'}{y}) + (2xy^2 + y \ln y)(2xy + x^2y' + 1)}{(x^2y + x)^2}$$

$$\left[y''_{xx}(x_0) = \frac{(+1+1)(-2+4+1) + (2)(2+1+1)}{1} = 10. \right]$$