10. $y = \frac{\ln x}{x^2}$ $\quad (0, 4]$

① $p' = \frac{1}{x} \quad q' = 2x$

$$\frac{p'q - pq'}{q^2}$$

$$y' = \frac{\frac{1}{x} \cdot x^2 - \ln x\,(2x)}{(x^2)^2}$$

$$= \frac{x - 2x\ln x}{x^4}$$

$$= \frac{x(1 - 2\ln x)}{x^4}$$

$$= \frac{1 - 2\ln x}{x^3}$$

② $1 - 2\ln x = 0 \qquad x^3 = 0$

$1 = 2\ln x \qquad x = 0$ ~~$x = 0$~~

$\frac{1}{2} = \ln e^x$

$e^{1/2} = x$

③

$x = e^{1/2}$ $\qquad$ $x = 4$

$f(x) = \frac{\ln x}{x^2}$ $\qquad$ $f(x) = \frac{\ln x}{x^2}$

$f(e^{1/2}) = \frac{\ln e^{1/2}}{(e^{1/2})^2}$ $\qquad$ $f(4) = \frac{\ln 4}{4^2}$

$= \frac{\frac{1}{2}}{e}$ $\qquad$ $= \frac{\ln 4}{16}$

$= \frac{1}{2e}$ $\qquad$ $\approx .09$

$\approx .18$

ABS MIN

$\left(4, \frac{\ln 4}{16}\right)$

ABS MAX

$\left(e^{\frac{1}{2}}, \frac{1}{2e}\right)$