in x
log

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1) $y = (2x^2+3)/\ln 2x$

$\ln y = \ln(2x^2+3) - \ln(\ln 2x)$

$\frac{d}{dx}(\ln y) = \frac{d}{dx}(2x^2+3) - \frac{d}{dx}(\ln 2x)$

$\frac{1}{y} \cdot dy/dx = \frac{1}{2x^2+3}(4x) - \frac{1}{\ln 2x}(\frac{2}{2x})$

$dy/dx = y\left(\frac{4x}{2x^2+3} - \frac{2}{2x \ln 2x}\right)$

$dy/dx = \frac{(2x^2+3)}{\ln 2x}\left(\frac{4x}{2x^2+3} - \frac{2}{2x \ln 2x}\right)$

at $x = 2.5$

$= 2(2.5)^2+3/\ln 2(2.5) \left(\frac{4(2.5)}{2(2.5)^2+3} - \frac{2}{2(2.5)\ln 2(2.5)}\right)$

$9.63(9.63 - 0.25)$

90.32

2) $y = 2x^u/(x^2-5)^v$

$d \quad \frac{vdu - udv}{v^2}$

$dy/dx = \frac{(x^2-5)d(2x) - 2x\,d(x^2-5)}{(x^2-5)^2}$

$dy/dx \quad \frac{(x^2-5)(2) - 2x(2x)}{(x^2-5)^2}$

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~~(3) $z = 2x^3 \ln y$~~

$$\frac{3x^2 - 10 - 4x^2}{(x^2-5)^2}$$

$$= \frac{-x^2 - 10}{(x^2-5)^2}$$

at point $(2, -4)$

$$\frac{dy}{dx} = \frac{-2(2)^2 - 10}{((2)^2-5)^2}$$

$$= \frac{-2(4) - 10}{(4-5)^2}$$

$$= \frac{-8-10}{1}$$

$$= -2$$

(3) $z = 2x^3 \ln y$

$$\frac{dz}{dy} = 2x^3 \frac{1}{y}$$