STEP/Differentiation Q3 (15/6/23)

Show that $\frac{d}{dx}(x^x) = x^x(1 + lnx)$

Solution

Let $y = x^x$

Then $lny = xlnx$

and $\frac{1}{y}\frac{dy}{dx} = lnx + x(\frac{1}{x})$

so that $\frac{dy}{dx} = y(lnx + 1) = x^x(1 + lnx)$