Differentiation – Q1 (9/5/21)

Question [P]

Find the derivative of $tanx$ using (a) the Quotient rule, and (b) the Product rule

Solution

(a) $\frac{d}{dx}(tanx) = \frac{d}{dx}\left(\frac{sinx}{cosx}\right) = \frac{cosx(cosx) - sinx(-sinx)}{cos^2x}$

$= (cos^2x + sin^2x)sec^2x$

$= sec^2x$

(b) $\frac{d}{dx}(tanx) = \frac{d}{dx}(sinx\,.(cosx)^{-1})$

$= cosx(cosx)^{-1} + (sinx)(-1)(cosx)^{-2}(-sinx)$

$= 1 + tan^2x = sec^2x$