



Differentiation Ex 11.2 Q6

Let,

$$y = e^{\tan x}$$

Differentiate it with respect to x ,

$$\begin{aligned} \frac{dy}{dx} &= \frac{d}{dx} (e^{\tan x}) \\ &= e^{\tan x} \frac{d}{dx} (\tan x) && \text{[Using chain rule]} \\ &= e^{\tan x} \times \sec^2 x \end{aligned}$$

So,

$$\frac{d}{dx} (e^{\tan x}) = \sec^2 x \times e^{\tan x}.$$

Differentiation Ex 11.2 Q7

Let,

$$y = \sin^2 (2x + 1)$$

Differentiate it with respect to x ,

$$\begin{aligned} \frac{dy}{dx} &= \frac{d}{dx} [\sin^2 (2x + 1)] \\ &= 2 \sin (2x + 1) \frac{d}{dx} \sin (2x + 1) && \text{[Using chain rule]} \\ &= 2 \sin (2x + 1) \cos (2x + 1) \frac{d}{dx} (2x + 1) && \text{[Using chain rule]} \\ &= 4 \sin (2x + 1) \cos (2x + 1) \\ &= 2 \sin 2 (2x + 1) && \text{[Since, } \sin^2 A = 2 \sin A \cos A \text{]} \\ &= 2 \sin (4x + 2) \end{aligned}$$

So,

$$\frac{d}{dx} (\sin^2 (2x + 1)) = 2 \sin (4x + 2).$$

Differentiation Ex 11.2 Q8

Let,

$$y = \log_7 (2x - 3)$$

$$\Rightarrow y = \frac{\log (2x - 3)}{\log 7} \quad \left[\text{Since, } \log_a b = \frac{\log b}{\log a} \right]$$

Differentiate it with respect to x ,

$$\begin{aligned} \frac{dy}{dx} &= \frac{1}{\log 7} \frac{d}{dx} (\log (2x - 3)) \\ &= \frac{1}{\log 7} \times \frac{1}{(2x - 3)} \frac{d}{dx} (2x - 3) && \text{[Using chain rule]} \\ &= \frac{2}{(2x - 3) \log 7} \end{aligned}$$

Hence,

$$\frac{d}{dx} (\log_7 (2x - 3)) = \frac{2}{(2x - 3) \log 7}.$$

Differentiation Ex 11.2 Q9

Let,

$$y = \tan 5x^\circ$$

$$\Rightarrow y = \tan \left(5x^\circ \times \frac{\pi}{180^\circ} \right)$$

Differentiate with respect to x ,

$$\begin{aligned} \frac{dy}{dx} &= \frac{d}{dx} \tan \left(5x^\circ \times \frac{\pi}{180^\circ} \right) \\ &= \sec^2 \times \left(5x^\circ \times \frac{\pi}{180^\circ} \right) \frac{d}{dx} \left(5x^\circ \times \frac{\pi}{180^\circ} \right) && \text{[Using chain rule]} \\ &= \left(\frac{5\pi}{180^\circ} \right) \sec^2 \left(5x^\circ \times \frac{\pi}{180^\circ} \right) \\ &= \frac{5\pi}{180^\circ} \sec^2 (5x^\circ) \end{aligned}$$

Hence,

$$\frac{d}{dx} (\tan(5x^\circ)) = \frac{5\pi}{180^\circ} \sec^2 (5x^\circ).$$

Differentiation Ex 11.2 Q10

Let,

$$y = 2^{x^3}$$

Differentiate with respect to x ,

$$\begin{aligned} \frac{dy}{dx} &= \frac{d}{dx} (2^{x^3}) \\ &= 2^{x^3} \times \log_2 \frac{d}{dx} (x^3) && \text{[Using chain rule]} \\ &= 3x^2 \times 2^{x^3} \times \log_2 \end{aligned}$$

So,

$$\frac{d}{dx} (2^{x^3}) = 3x^2 \times 2^{x^3} \log_2.$$

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