

31. $\cos(\tan \sqrt{x+1})$

Sol. Let $y = \cos(\tan \sqrt{x+1})$

$$\begin{aligned} \frac{dy}{dx} &= \frac{d}{dx} \cos(\tan \sqrt{x+1}) \\ &= -\sin(\tan \sqrt{x+1}) \frac{d}{dx} (\tan \sqrt{x+1}) \\ &= -\sin(\tan \sqrt{x+1}) \sec^2 \sqrt{x+1} \cdot \frac{d}{dx} (x+1)^{1/2} \\ &= -\sin(\tan \sqrt{x+1}) \sec^2 \sqrt{x+1} \cdot \frac{1}{2} (x+1)^{-1/2} \\ &= \frac{-1}{2\sqrt{x+1}} \cdot \sin(\tan \sqrt{x+1}) \cdot \sec^2(\sqrt{x+1}) \end{aligned}$$

∴