

Q2) If  $y = \sqrt{\log x + \sqrt{\log x + \sqrt{\log x + \dots \infty}}}$ , then  $\frac{dy}{dx}$  is

Solution:

$$y = \sqrt{\log x + y}$$

$$\Rightarrow y^2 = \log x + y$$

$$2y \frac{dy}{dx} = \frac{1}{x} + \frac{dy}{dx}$$

$$\left[ \frac{dy}{dx} = \frac{1}{x(2y-1)} \right]$$