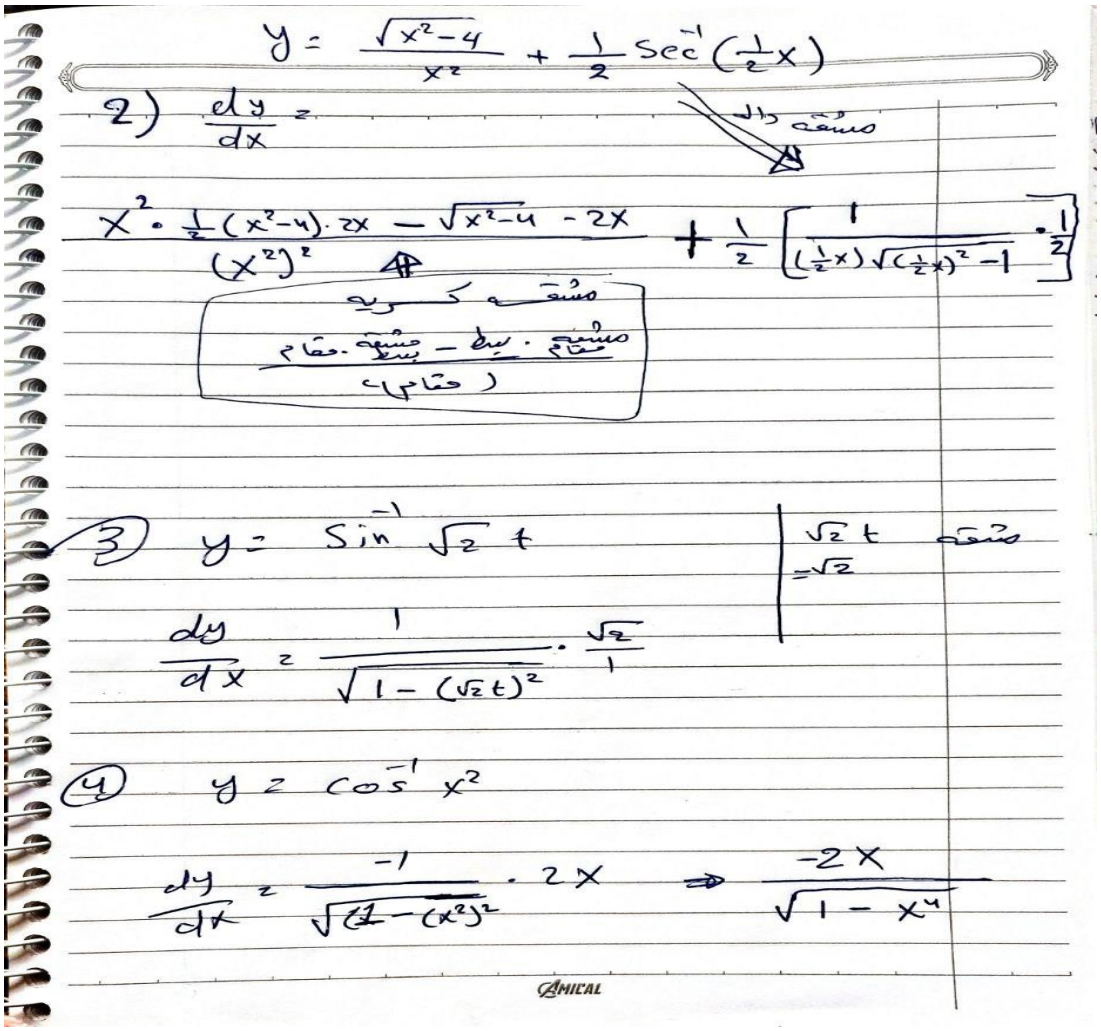
H.w 3

1-

If $y = \sin^{-1}(\frac{x-1}{x+1})$ $find$ $\frac{dy}{dx}$

Sol:

$$\frac{dy}{dx} = \frac{1}{\sqrt{1-\left(\frac{x-1}{x+1}\right)^2}} \cdot \frac{(x+1).1-(x-1).1}{(x+1)^2} = \frac{x+1-x+1}{\sqrt{1-\left(\frac{x-1}{x+1}\right)^2(x+1)^2}} = \frac{2}{\sqrt{1-\left(\frac{x-1}{x+1}\right)^2(x+1)^2}}$$



$$y = (x+1)^x = e^{x \ln(x+1)} \Rightarrow y' = e^{x \ln(x+1)} \left(x * \frac{1}{x+1} + \ln(x+1) \right)$$

$$= (x+1)^x \left(\frac{x}{x+1} + \ln(x+1) \right)$$