

$$\lim_{x \rightarrow 0} \frac{ax \cos x - b \ln(1+x)}{x^2} = 2$$

$$\therefore \lim_{x \rightarrow 0} \frac{ax \cos x - b \ln(1+x)}{x^2} \quad \left(\frac{0}{0} \text{ form} \right)$$

Apply d.L Hospital Rule

$$\Rightarrow \lim_{x \rightarrow 0} \frac{\frac{d}{dx} [ax \cos x - b \ln(1+x)]}{\frac{d}{dx} (x^2)}$$

$$\Rightarrow \lim_{x \rightarrow 0} \frac{a \cos x - ax \sin x - b \times \frac{1}{1+x}}{2x} \quad \left(\frac{a-b}{0} \right)$$

Now ~~next diff~~ we can differentiate
 it further if $a = b$ bcoz $(a-b)$ should be 0
 so that we can apply L hospital rule