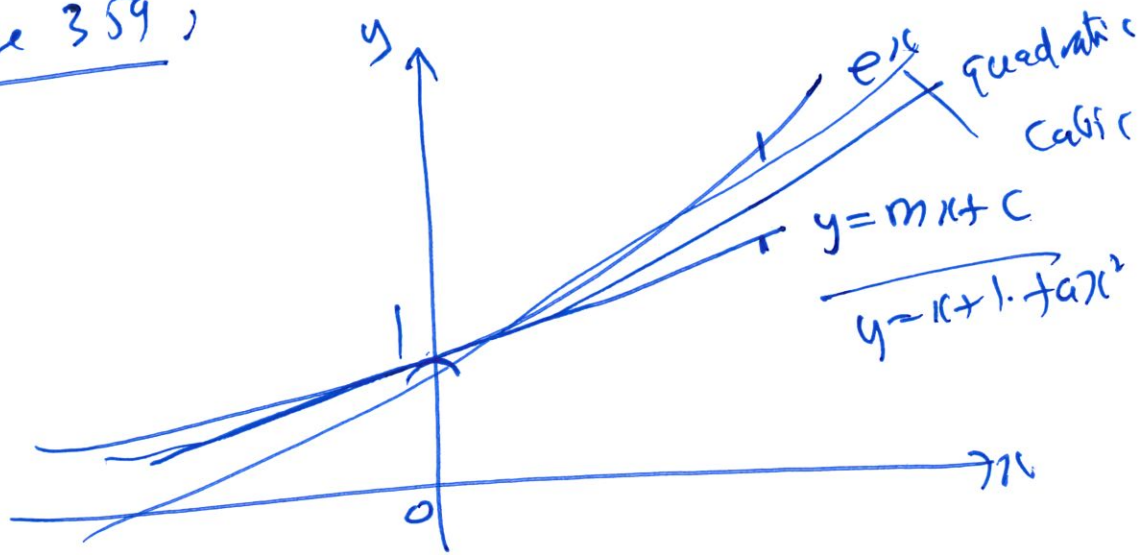


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$$y = mx + 1$$

$$m = (e^x)' = e^x = e^0 = 1.$$

$$y = x + 1$$

$$e^x = 1 + x + \frac{x^2}{2!} + \frac{x^3}{3!} + \frac{x^4}{4!} + \dots$$

$$\sin(x) = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \dots$$

series.

$$(*) \quad f(x) = A + Bx + Cx^2 + Dx^3 + Ex^4 + \dots$$

Subs  $x=0$ ;

$$f(0) = A$$

$$(*) \quad f'(x) = 0 + B + 2Cx + 3Dx^2 + 4Ex^3 + \dots$$

$x=0$

$$f'(0) = B + 0 \Rightarrow \underline{B = f'(0)}.$$

Diff (\*\*) gives:

$$(f) \quad f''(x) = 2C + 3(2)Dx + 4(3)Ex^2 + \dots$$

Subs  $x=0$ ;

$$f''(0) = 2C + 0 + 0 + \dots$$

$$2C = f''(0)$$

$$C = \frac{f''(0)}{2} = \frac{f''(0)}{2!}$$

Diff (f) yields:

$$f'''(x) = 3(2)D + 4(3)(2)Ex + \dots$$

$x=0$ ;

$$f'''(0) = 3(2)D + 0$$

$$D = \frac{f'''(0)}{3(2)} = \frac{f'''(0)}{3!}$$

$$E = \frac{f^{(4)}(0)}{4!}$$

$$f(x) = A + Bx + Cx^2 + Dx^3 + Ex^4 + \dots$$

$$= f(0) + f'(0)x + \frac{f''(0)}{2!}x^2 + \frac{f'''(0)}{3!}x^3 + \frac{f^{(4)}(0)}{4!}x^4 + \dots$$

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