## COMPOSITE FUNCTIONS AND GEARS

Suppose we have three gears A, B and C with circumference X, Y, Z. respectively



Let red gear has circumference is X cm, and that of black one is of Y cm.

And third one has circumference Z cm.

One gap of Y is of thickness  $\Delta Y$  and similarly one tooth of X is of thickness  $\Delta X$ , although these gap and tooth are of approximately of same thickness but number of division of  $\Delta Y$  and  $\Delta X$  on their respective circumference may be different, usually different,

Hence we have 
$$\frac{\Delta y}{\Delta x}$$
, similarly between Y and Z  $\frac{\Delta z}{\Delta y}$ 

Suppose g is a function  $g: X \to Y$  and f is a function  $f: Y \to Z$ 

So we see that functions of gears obey rules of composite functions  $\frac{dz}{dx} = \frac{dy}{dx}\frac{dz}{dy}$  and hence chain goes on . which is mathematically fog(x).