



## CHEAT SHEETS FOR FUNCTIONAL EQUATION

Functional equation is an equation where the unknown is a function. On solving such equations we get one or more functions as solutions

Formulas that should be learnt

$$\bullet \quad f(xy) = f(x) + f(y) \quad \Rightarrow \quad f(x) = k \ln x \quad k \in \mathbb{R}$$

$$\bullet \quad f(xy) = f(x) \cdot f(y) \quad \Rightarrow \quad f(x) = x^n \text{ or } 0 \quad n \in \mathbb{R}$$

$$\bullet \quad f(x+y) = f(x) + f(y) \quad \Rightarrow \quad f(x) = kx \quad k \in \mathbb{R}$$

○ Special Case

*if  $f(1)$  is given then  $f(x) = x f(1)$*

$$\bullet \quad f(x+y) = f(x) \cdot f(y) \quad \Rightarrow \quad f(x) = 0 \text{ or } a^x \quad a > 0$$

○ Special Case

*if  $f(1)$  is given then  $f(x) = (f(1))^x$*

Watch the recording of the live lecture on functional equations. There is a high probability that questions being asked on the similar lines in JEE as taken in the session.

Click here for the session <http://bit.ly/mogjm05>

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