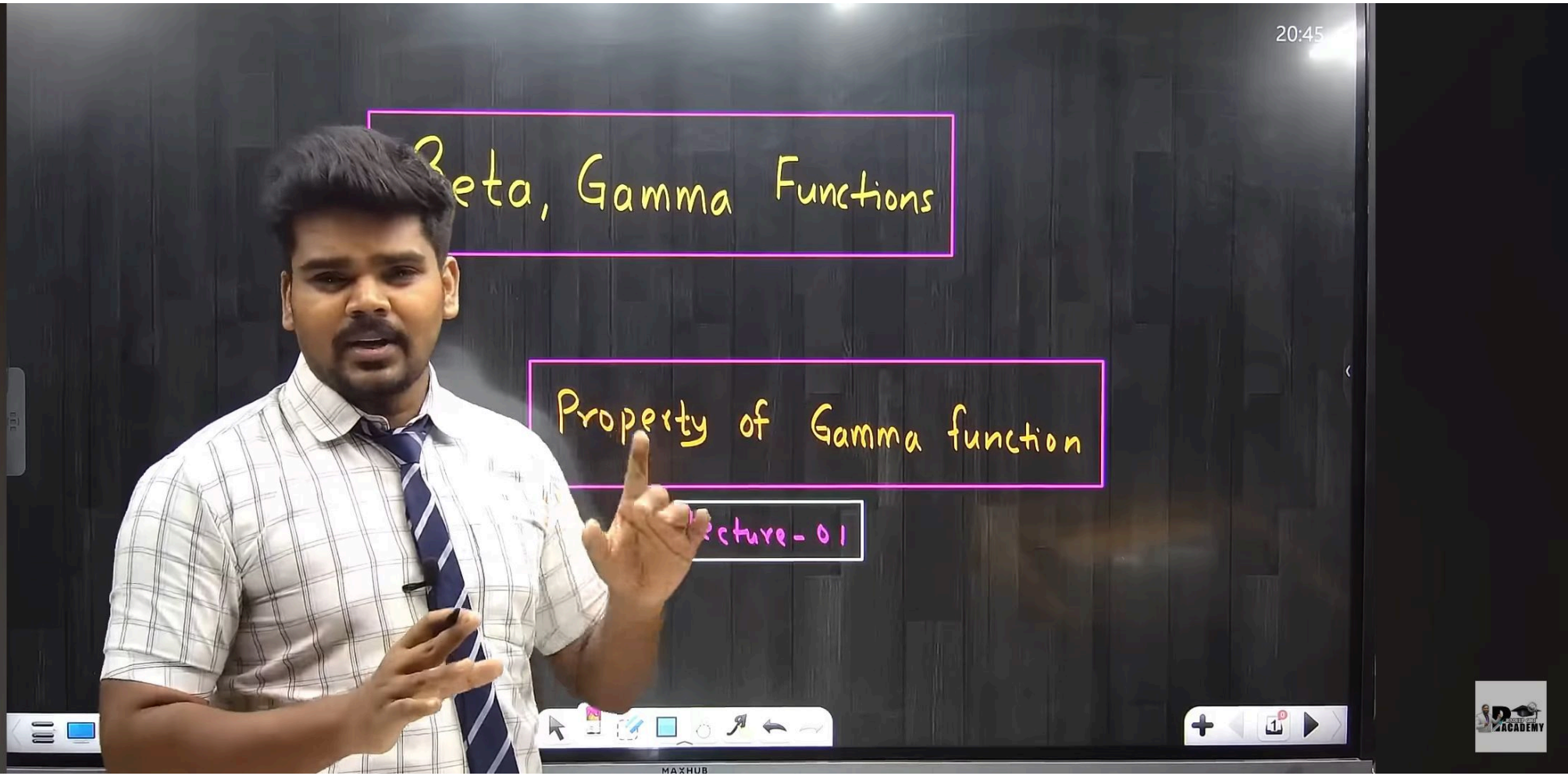
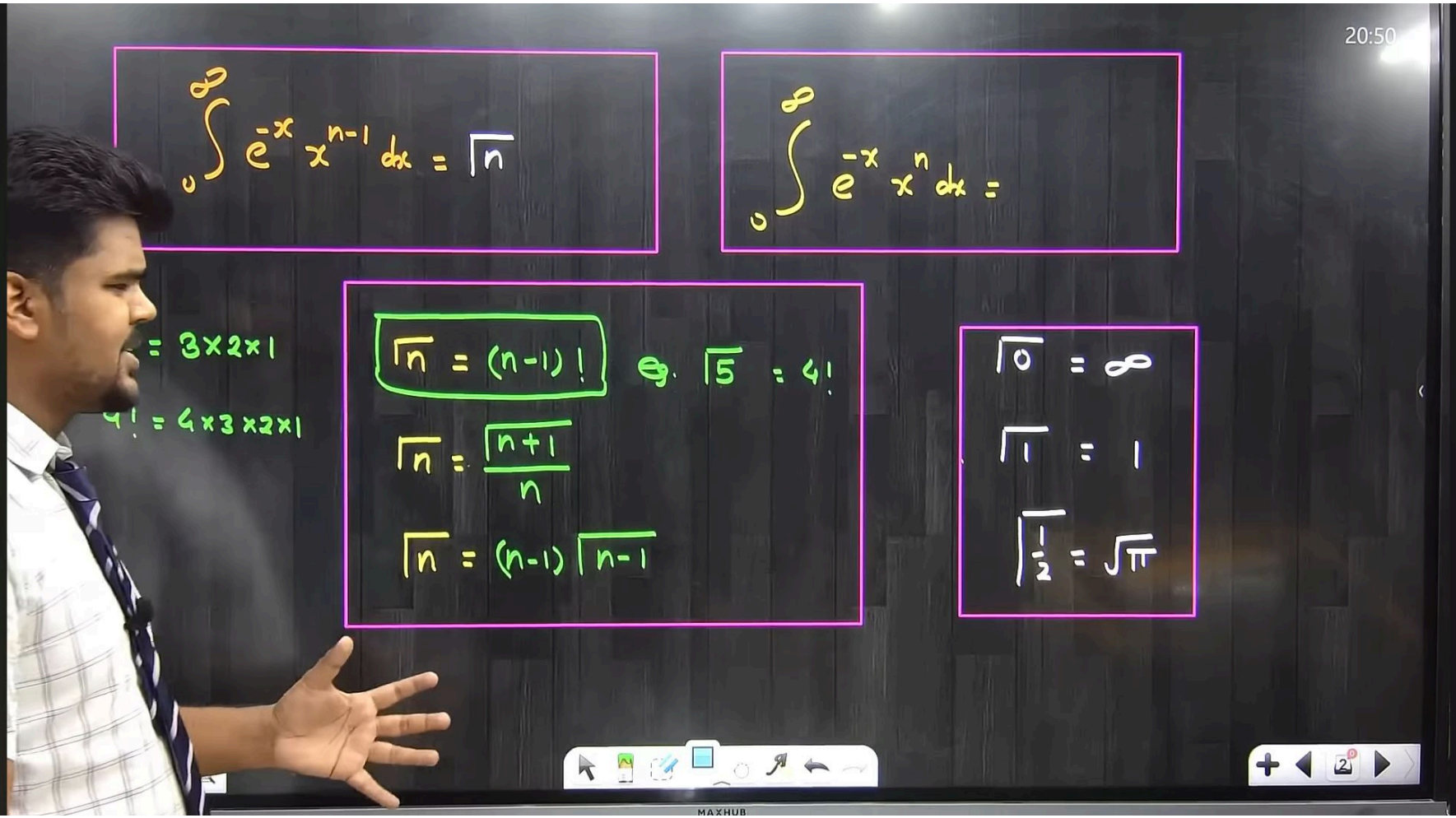
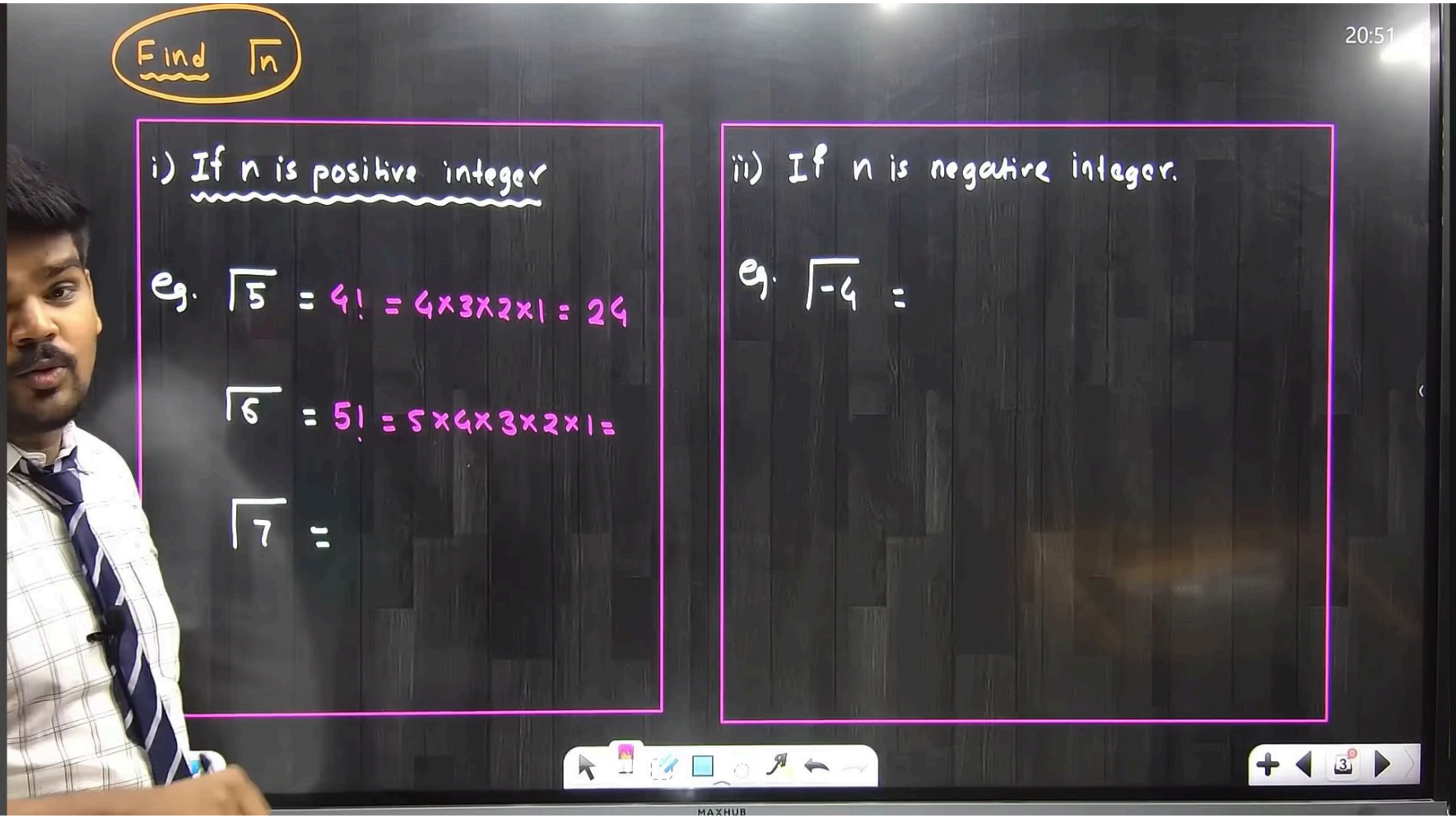
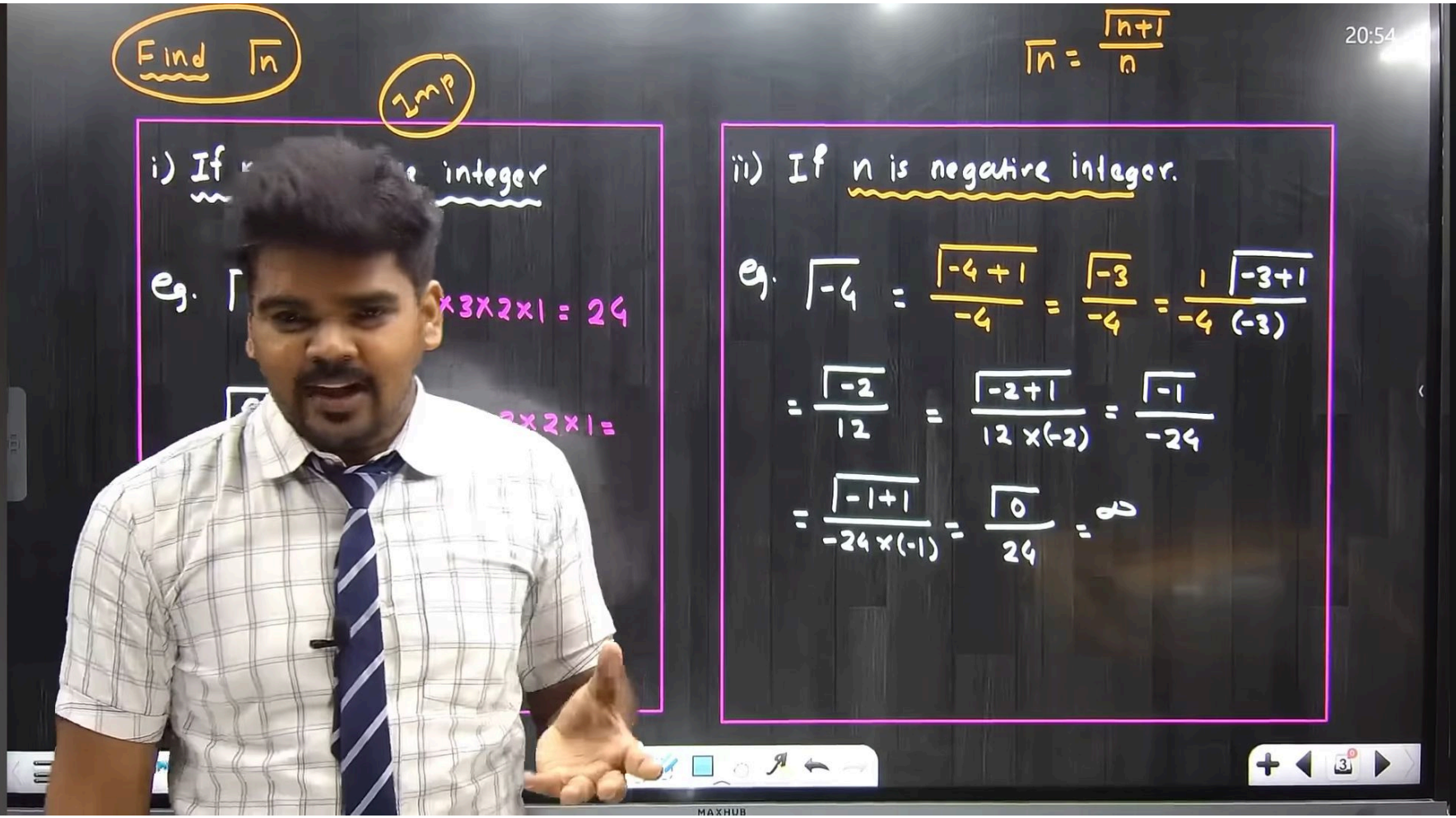
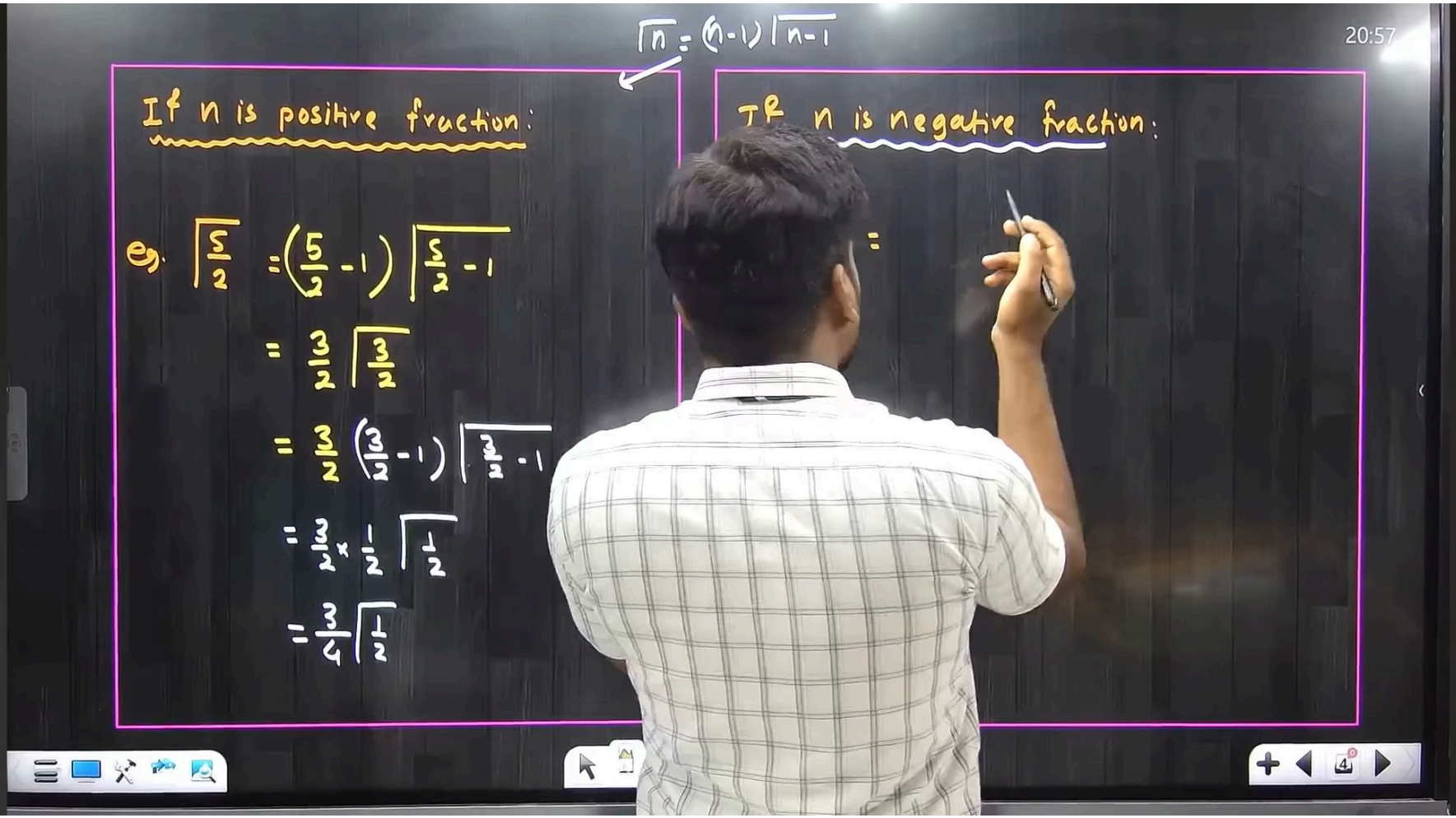
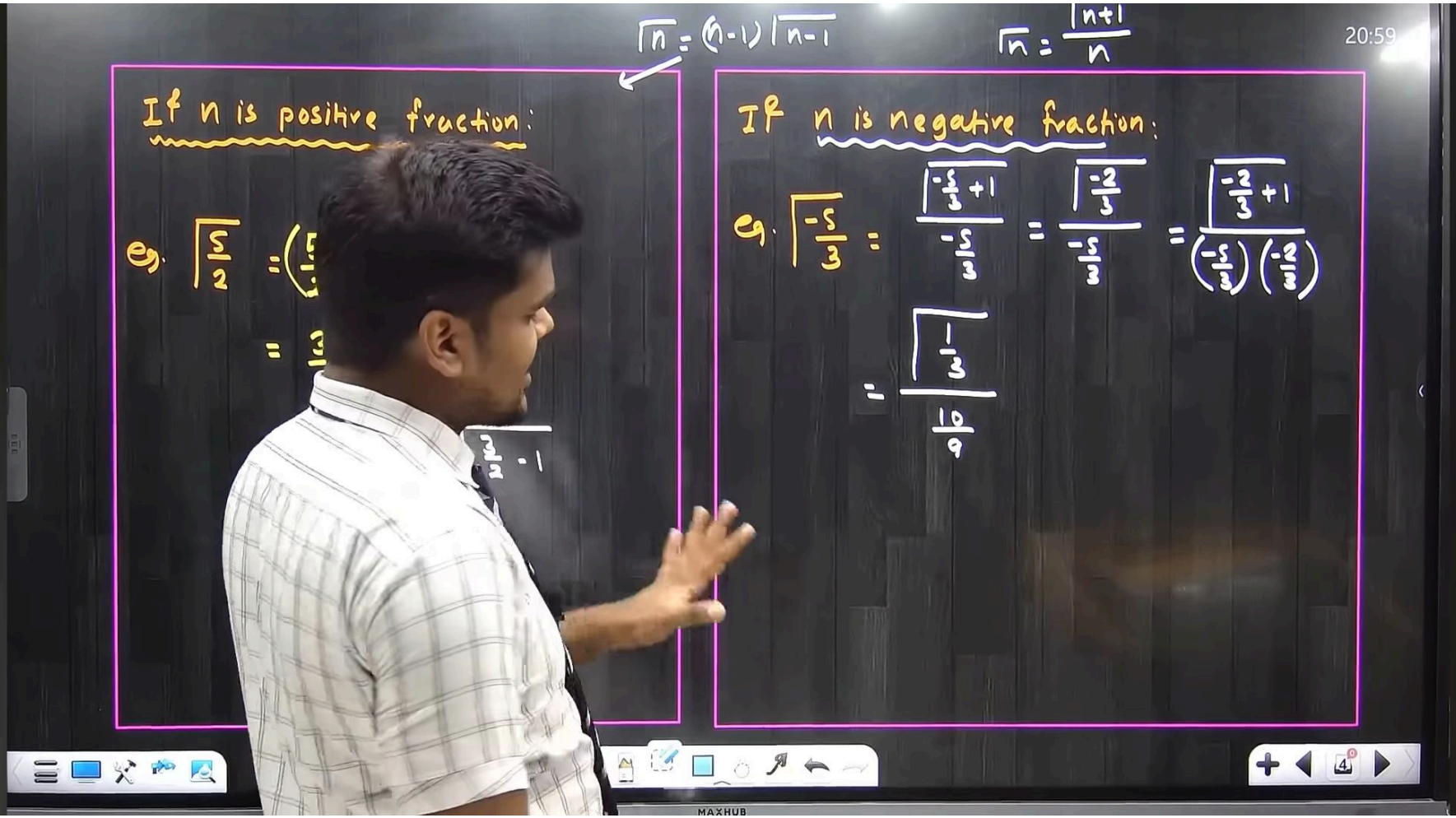

20:45
Beta, Gamma Functions
Property of Gamma function
Lecture-01
MAXHUB

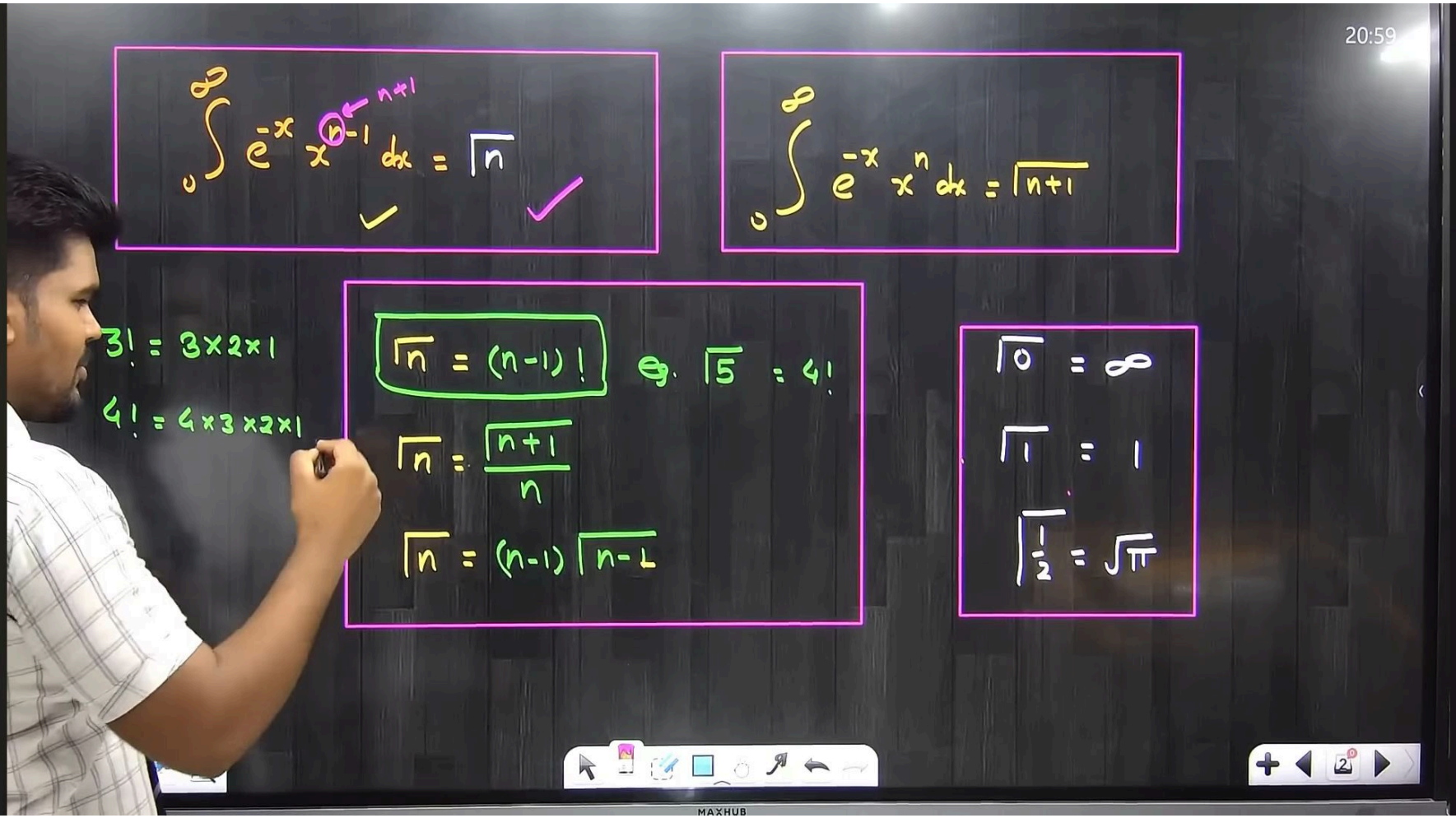

20:50
$\int_0^\infty e^{-x} x^{n-1} dx = \Gamma n$
$\int_0^\infty e^{-x} x^{n} dx =$
$= 3 \times 2 \times 1$
$4! = 4 \times 3 \times 2 \times 1$
$\Gamma n = (n-1)!$ eg. $\Gamma 5 = 4!$
$\Gamma n = \frac{\Gamma n+1}{n}$
$\Gamma n = (n-1)\Gamma n-1$
$\Gamma 0 = \infty$
$\Gamma 1 = 1$
$\Gamma \frac{1}{2} = \sqrt{\pi}$
MAXHUB


Find ⌐n
i) If n is positive integer
eg. ⌐5 = 4! = 4×3×2×1 = 24
⌐6 = 5! = 5×4×3×2×1=
⌐7 =
ii) If n is negative integer.
eg. ⌐-4 =
20:51
MAXHUB


Find ⌈n
Imp
⌈n = ⌈n+1 / n
20:54
i) If n integer
eg. ⌈ ×3×2×1 = 24
2×2×1=
ii) If n is negative integer.
eg. ⌈-4 = ⌈-4+1 / -4 = ⌈-3 / -4 = 1 ⌈-3+1 / -4 (-3)
= ⌈-2 / 12 = ⌈-2+1 / 12×(-2) = ⌈-1 / -24
= ⌈-1+1 / -24×(-1) = ⌈0 / 24 = ∞
MAXHUB


$\Gamma n = (n-1)\Gamma n-1$
20:57
If n is positive fraction:
eg. $\Gamma\frac{5}{2} = \left(\frac{5}{2}-1\right)\Gamma\frac{5}{2}-1$
$= \frac{3}{2}\Gamma\frac{3}{2}$
$= \frac{3}{2}\left(\frac{3}{2}-1\right)\Gamma\frac{3}{2}-1$
$= \frac{3}{2}\times\frac{1}{2}\Gamma\frac{1}{2}$
$= \frac{3}{4}\Gamma\frac{1}{2}$
If n is negative fraction:
=


$\Gamma n = (n-1)\Gamma n-1$
$\Gamma n = \frac{\Gamma n+1}{n}$
20:59
If n is positive fraction:
eg. $\Gamma\frac{5}{2} = \left(\frac{1}{2}\right)\Gamma$
$= \frac{1}{2}\Gamma$
$\Gamma\frac{n+1}{n} - 1$
If n is negative fraction:
eg. $\Gamma\frac{-5}{3} = \frac{\Gamma\frac{-5}{3}+1}{\frac{-5}{3}} = \frac{\Gamma\frac{-2}{3}}{\frac{-5}{3}} = \frac{\Gamma\frac{-2}{3}+1}{\left(\frac{-5}{3}\right)\left(\frac{-2}{3}\right)}$
$= \frac{\Gamma\frac{1}{3}}{\frac{10}{9}}$
MAXHUB


20:59
$\int_0^\infty e^{-x} x^{n-1} dx = \Gamma n$
$n+1$
$\int_0^\infty e^{-x} x^{n} dx = \Gamma(n+1)$
$3! = 3\times2\times1$
$4! = 4\times3\times2\times1$
$\Gamma n = (n-1)!$ eg. $\Gamma 5 = 4!$
$\Gamma n = \frac{\Gamma(n+1)}{n}$
$\Gamma n = (n-1)\Gamma(n-1)$
$\Gamma 0 = \infty$
$\Gamma 1 = 1$
$\Gamma \frac{1}{2} = \sqrt{\pi}$
MAXHUB