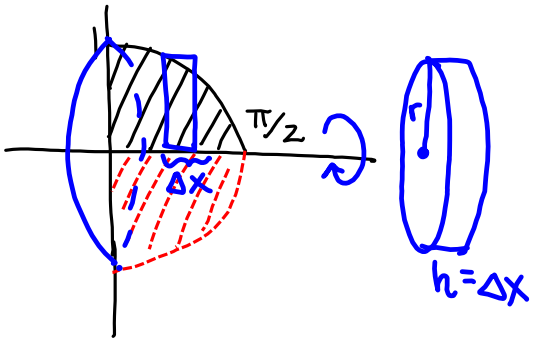
34. $y=\cos x$, $y=0$, $x=0$, $x=\frac{\pi}{2}$

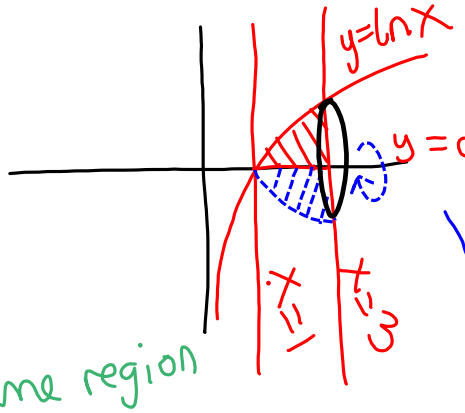
revolve about x-axis



$$V=\int_0^{\frac{\pi}{2}} \pi \cos^2 x \, dx$$

36. $y=\ln x$, $y=0$, $x=1$, $x=3$

about x-axis



$$V=\int_1^3 \pi (\ln x)^2 dx$$

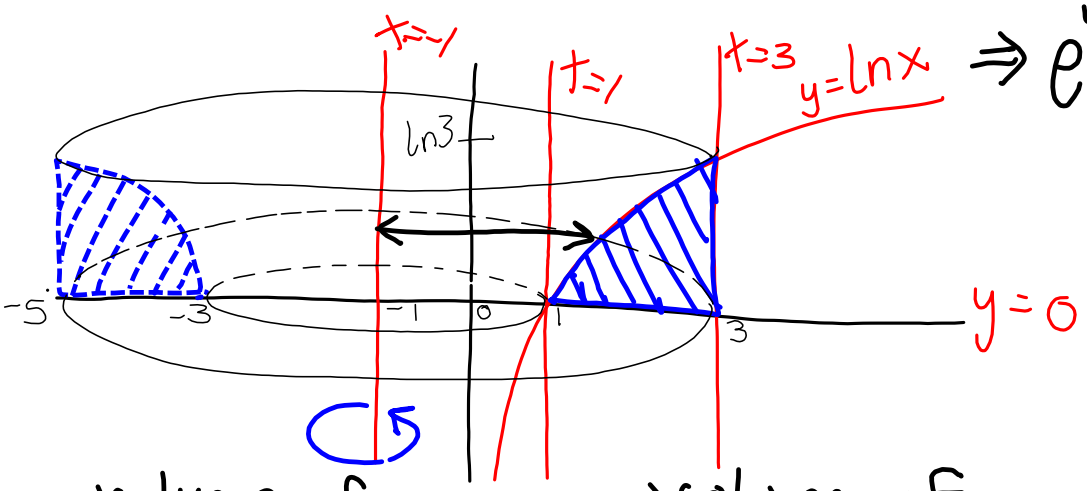
$\ln x = \log_e x$

$\log_e x = 0$

$e^0 = x = 1$

same region

about $x=-1$



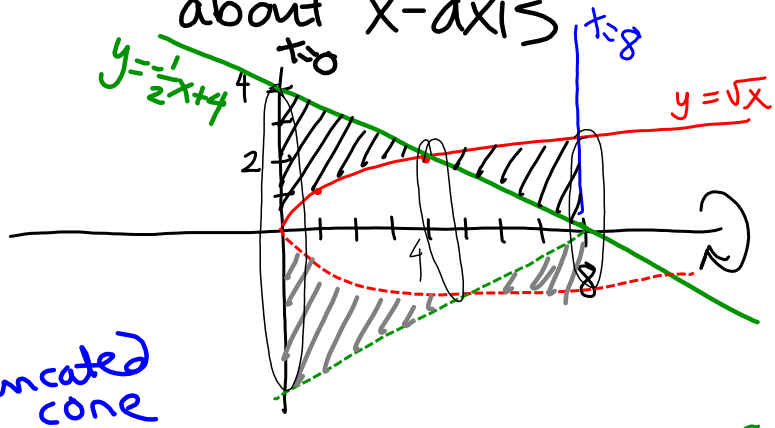
$\Rightarrow e^y = x$

$V =$ volume of outer cylinder $-$ volume of inner funnel

$= \pi(4)^2 \ln 3 - \int_0^{\ln 3} \pi (e^y + 1)^2 \, dy$

30. $y = \sqrt{x}$, $y = -\frac{1}{2}x + 4$, $x = 0$, $x = 8$

about x-axis



truncated cone

$$\int_0^4 \pi \left(-\tfrac{1}{2}x+4\right)^2 dx - \int_0^4 \pi \left(\sqrt{x}\right)^2 dx + \int_4^8 \pi \left(\sqrt{x}\right)^2 dx - \int_4^8 \pi \left(-\tfrac{1}{2}x+4\right)^2 dx$$

cone

$\frac{1}{3}\pi(2)^2 \cdot 4$