Lecture 12: L'Hopital etcetera

Monday, October 5, 2015 12:22 PM

In video: focused on indeterminate forms $\frac{0}{0}$ & $\frac{\infty}{\infty}$

ex: $\lim_{x\to 0} \frac{1-\cos x}{\sin x} = \lim_{x\to 0} \frac{(1-\cos x)'}{(\sin x)'} = \lim_{x\to 0} \frac{\sin x}{\cos x} = \frac{0}{1} = 0$

$\frac{f(x)}{g(x)}$ $f(x) \to 1-1=0$, $g(x) \to 0$ "$\frac{0}{0}$" indeterminate form

$\lim_{x\to 0^+} \left(x+\frac{1}{x}\right)\left((4-x)^{3/2}-8\right) = \lim_{x\to 0^+} \frac{\left((4-x)^{3/2}-8\right)}{\left(x+1/x\right)^{-1}}$

$(0+\frac{1}{0})$

$x+\frac{1}{x} \to \infty$

$(4-x)^{3/2}-8$

$4^{3/2}-8 = \left(\sqrt{4}\right)^3-8 = 2^3-8 = 0$.