2017-10-26 Lösning 2b

Bestäm gränsvärdet

$$\lim_{x \to \frac{\pi}{3}} \frac{1-2\cos x}{\sin\left(\frac{\pi}{3}-x\right)}.$$

Sätt $\frac{\pi}{3}-x=t$, $x \to \frac{\pi}{3} \Leftrightarrow t \to 0$

$$\frac{1-2\cos\left(\frac{\pi}{3}-t\right)}{\sin t} = \frac{1-2\left(\frac{1}{2}\cos t+\frac{\sqrt{3}}{2}\sin t\right)}{\sin t} =$$

$$= \frac{1-\cos t}{\sin t} - \sqrt{3} = \frac{1-\cos^2 t}{\sin t(1+\cos t)} - \sqrt{3} =$$

$$= \frac{\sin^2 t}{\sin t(1+\cos t)} - \sqrt{3} \xrightarrow[t \to 0]{} -\sqrt{3}$$