

លីមីតត្រូវម្នាក់ទៀត

ឧទាហរណ៍ ២

គណនាលីមីតខាងក្រោម៖

ក $\lim_{x \rightarrow 1} \frac{x^3 + 3x^2 + 2x - 6}{x^2 - 3x + 2}$

ខ $\lim_{x \rightarrow 0} \frac{3x}{\sin 2x}$

គ $\lim_{x \rightarrow \frac{\pi}{6}} \frac{\sqrt{3} \sin x - \cos x}{6x - \pi}$

ដំណោះស្រាយ

ក $\lim_{x \rightarrow 1} \frac{x^3 + 3x^2 + 2x - 6}{x^2 - 3x + 2}$ រាងមិនកំណត់ $\frac{0}{0}$

$$\begin{aligned}\lim_{x \rightarrow 1} \frac{x^3 + 3x^2 + 2x - 6}{x^2 - 3x + 2} &= \lim_{x \rightarrow 1} \frac{x^3 - x^2 + 4x^2 - 4x + 6x - 6}{x^2 - x - 2x + 2} \\&= \lim_{x \rightarrow 1} \frac{x^2(x - 1) + 4x(x - 1) + 6(x - 1)}{x(x - 1) - 2(x - 1)} \\&= \lim_{x \rightarrow 1} \frac{\cancel{(x - 1)}(x^2 + 4x + 6)}{\cancel{(x - 1)}(x - 2)} \\&= \lim_{x \rightarrow 1} \frac{x^2 + 4x + 6}{x - 2}\end{aligned}$$

ដំណោះស្រាយ

$$= \frac{(1)^2 + 4(1) + 6}{(1) - 2} = \frac{1 + 4 + 6}{-1} = -11$$

ខ $\lim_{x \rightarrow 0} \frac{3x}{\sin 2x}$ រាងមិនកំណត់ $\frac{0}{0}$

$$\begin{aligned} \lim_{x \rightarrow 0} \frac{3x}{\sin 2x} &= \lim_{x \rightarrow 0} \left(\frac{2x}{\sin 2x} \times \frac{3}{2} \right) \\ &= 1 \times \frac{3}{2} = \frac{3}{2} \end{aligned}$$

ត្រូវ: $\lim_{u \rightarrow 0} \frac{u}{\sin u} = \lim_{u \rightarrow 0} \frac{1}{\frac{\sin u}{u}} = \frac{1}{1} = 1$

ដំណោះស្រាយ

គ $\lim_{x \rightarrow \frac{\pi}{6}} \frac{\sqrt{3} \sin x - \cos x}{6x - \pi}$ រាងមិនកំណត់ $\frac{0}{0}$

$$\begin{aligned} \lim_{x \rightarrow \frac{\pi}{6}} \frac{\sqrt{3} \sin x - \cos x}{6x - \pi} &= \lim_{x \rightarrow \frac{\pi}{6}} \frac{2 \left(\frac{\sqrt{3}}{2} \sin x - \frac{1}{2} \cos x \right)}{6 \left(x - \frac{\pi}{6} \right)} \\ &= \lim_{x \rightarrow \frac{\pi}{6}} \frac{2 \left(\sin x \cos \frac{\pi}{6} - \cos x \sin \frac{\pi}{6} \right)}{6 \left(x - \frac{\pi}{6} \right)} \\ &= \lim_{x \rightarrow \frac{\pi}{6}} \frac{2 \sin \left(x - \frac{\pi}{6} \right)}{6 \left(x - \frac{\pi}{6} \right)} \end{aligned}$$

ដំណោះស្រាយ

$$= \lim_{x \rightarrow \frac{\pi}{6}} \frac{1}{3} \times \frac{\sin \left(x - \frac{\pi}{6} \right)}{x - \frac{\pi}{6}}$$

$$= \frac{1}{3} \times 1 = \frac{1}{3}$$

ឆ្លៀត៖ $\lim_{u \rightarrow 0} \frac{\sin u}{u} = 1$ ដែល $u = x - \frac{\pi}{6}$