

លីមីតត្រូវបានបញ្ជាក់ខុស

ឧទាហរណ៍ ៥

គណនាលីមីតខាងក្រោម៖

ក $\lim_{x \rightarrow 2} \frac{x^3 - 2x^2 - x + 2}{x^2 - 5x + 6}$

ខ $\lim_{x \rightarrow 0} \frac{\tan 3x}{5x}$

គ $\lim_{x \rightarrow 0} \frac{\sin 2x - 2 \sin x}{x^2 \sin x}$

ដំណោះស្រាយ

ក $\lim_{x \rightarrow 2} \frac{x^3 - 2x^2 - x + 2}{x^2 - 5x + 6}$ រាងមិនកំណត់ $\frac{0}{0}$

$$\begin{aligned}\lim_{x \rightarrow 2} \frac{x^3 - 2x^2 - x + 2}{x^2 - 5x + 6} &= \lim_{x \rightarrow 2} \frac{x^2(x - 2) - (x - 2)}{x^2 - 2x - 3x + 6} \\ &= \lim_{x \rightarrow 2} \frac{(x - 2)(x^2 - 1)}{x(x - 2) - 3(x - 2)} \\ &= \lim_{x \rightarrow 2} \frac{\cancel{(x - 2)}(x^2 - 1)}{\cancel{(x - 2)}(x - 3)} \\ &= \lim_{x \rightarrow 2} \frac{x^2 - 1}{x - 3}\end{aligned}$$

ដំណោះស្រាយ

$$= \frac{2^2 - 1}{2 - 3} = \frac{3}{-1} = -3$$

ខ $\lim_{x \rightarrow 0} \frac{\tan 3x}{5x}$ ជាប់មិនកំណត់ $\frac{0}{0}$

$$\lim_{x \rightarrow 0} \frac{\tan 3x}{5x} = \lim_{x \rightarrow 0} \left(\frac{\tan 3x}{3x} \times \frac{3}{5} \right) = 1 \times \frac{3}{5} = \frac{3}{5}$$

ចំពោះ $\lim_{u \rightarrow 0} \frac{\tan u}{u} = 1$ ដែល $u = 3x$

ដំណោះស្រាយ

គ $\lim_{x \rightarrow 0} \frac{\sin 2x - 2 \sin x}{x^2 \sin x}$ រាងមិនកំណត់ $\frac{0}{0}$

$$\begin{aligned}\lim_{x \rightarrow 0} \frac{\sin 2x - 2 \sin x}{x^2 \sin x} &= \lim_{x \rightarrow 0} \frac{2 \sin x \cos x - 2 \sin x}{x^2 \sin x} \\&= \lim_{x \rightarrow 0} \frac{2 \cancel{\sin x} (\cos x - 1)}{x^2 \cancel{\sin x}} \\&= \lim_{x \rightarrow 0} \frac{2(\cos x - 1)}{x^2} \times \frac{(\cos x + 1)}{\cos x + 1} \\&= \lim_{x \rightarrow 0} \frac{2(\cos^2 x - 1)}{x^2 (\cos x + 1)}\end{aligned}$$

ដំណោះស្រាយ

$$= \lim_{x \rightarrow 0} \frac{2(-\sin^2 x)}{x^2(\cos x + 1)}$$

$$= \lim_{x \rightarrow 0} \left[\frac{\sin^2 x}{x^2} \times \frac{-2}{\cos x + 1} \right]$$

$$= \lim_{x \rightarrow 0} \left[\left(\frac{\sin x}{x} \right)^2 \times \frac{-2}{\cos x + 1} \right]$$

$$= (1)^2 \times \left(\frac{-2}{1 + 1} \right) = -1 \quad \text{ព្រោះ} \quad \lim_{x \rightarrow 0} \frac{\sin x}{x} = 1$$