លីមីតត្រៀមប្រាក់ឌុប

ឧទាហរណ៍ ១

គណនាលីមីតខាងក្រោម៖

ក $\lim\limits_{x\to 1}\dfrac{x^3-2x^2+3x-2}{1-x^2}$

ខ $\lim\limits_{x\to 0}\dfrac{\sin 3x}{4x}$

គ $\lim\limits_{x\to \frac{\pi}{4}}\dfrac{\sin x-\cos x}{\pi-4x}$

ដំណោះស្រាយ

ក $\lim\limits_{x\to 1}\dfrac{x^3-2x^2+3x-2}{1-x^2}$ ជាងមិនកំណត់ $\dfrac{0}{0}$

$$\lim_{x\to 1}\frac{x^3-2x^2+3x-2}{1-x^2}=\lim_{x\to 1}\frac{x^3-x^2-x^2+x+2x-2}{-(x^2-1)}$$

$$=\lim_{x\to 1}\frac{x^2(x-1)-x(x-1)+2(x-1)}{-(x^2-1^2)}$$

$$=\lim_{x\to 1}\frac{(x-1)(x^2-x+2)}{-(x-1)(x+1)}$$

$$=\lim_{x\to 1}\frac{x^2-x+2}{-(x+1)}=\frac{1^2-1+2}{-(1+1)}=-1$$

ដំណោះស្រាយ

ខ $\lim\limits_{x\to 0}\dfrac{\sin 3x}{4x}$ រាងមិនកំណត់ $\dfrac{0}{0}$

$$\lim_{x\to 0}\frac{\sin 3x}{4x}=\lim_{x\to 0}\frac{\sin 3x}{3x}\times\frac{3}{4}$$

$$=1\times\frac{3}{4}=\frac{3}{4}$$

គុណភាគយក និងភាគបែងដោយ 3

ព្រោះ $\lim\limits_{u\to 0}\dfrac{\sin u}{u}=1$ ដែល $u=3x$

ដំណោះស្រាយ

គ $\lim\limits_{x\to\frac{\pi}{4}} \dfrac{\sin x-\cos x}{\pi-4x}$ រាងមិនកំណត់ $\dfrac{0}{0}$

$$\lim_{x\to\frac{\pi}{4}} \frac{\sin x-\cos x}{\pi-4x} = \lim_{x\to\frac{\pi}{4}} \frac{\sqrt{2}\left(\frac{\sqrt{2}}{2}\sin x-\frac{\sqrt{2}}{2}\cos x\right)}{4\left(\frac{\pi}{4}-x\right)}$$

$$= \lim_{x\to\frac{\pi}{4}} \frac{\sqrt{2}}{4}\left(\frac{\sin x\cos\frac{\pi}{4}-\cos x\sin\frac{\pi}{4}}{\frac{\pi}{4}-x}\right)$$

ដំណោះស្រាយ

$$= \lim_{x \to \frac{\pi}{4}} \frac{\sqrt{2}}{4} \left[\frac{\sin\left(x - \frac{\pi}{4}\right)}{-\left(x - \frac{\pi}{4}\right)} \right]$$

$= \frac{\sqrt{2}}{4}(-1) = -\frac{\sqrt{2}}{4}$, ព្រោះ $\lim_{u \to 0} \frac{\sin u}{u} = 1$ ដែល $u = x - \frac{\pi}{4}$