

ឧទាហរណ៍-១

គណនាដេរីវេ របស់អនុគមន៍ ៖

$$y = \sqrt{\frac{1+x}{1-x}} = (1+x)^{\frac{1}{2}} (1-x)^{-\frac{1}{2}}, \quad (-1 \leq x < 1)$$

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យើងគណនា ដេរីវេ លោការីតមីក $\frac{y'}{y}$ ដោយសង្កេតថា ដេរីវេ លោការីតមីក u^m

គឺ $m \frac{u'}{u}$ ។ ដោយប្រើរូបមន្តនោះលើ $(1+x)^{\frac{1}{2}}$ និង $(1-x)^{-\frac{1}{2}}$ គេបាន ដេរីវេ

លោការីតមីក ៖

$$y = uv \quad \text{ដោយ} \quad u = (1+x)^{\frac{1}{2}} \quad \text{និង} \quad v = (1-x)^{-\frac{1}{2}}$$

$$u = (1+x)^{\frac{1}{2}} \Rightarrow u' = \frac{1}{2} (1+x)^{\frac{1}{2}-1} = \frac{1}{2} (1+x)^{-\frac{1}{2}} \Rightarrow \frac{u'}{u} = \frac{1}{2} (1+x)^{-\frac{1}{2}} \bigg/ (1+x)^{\frac{1}{2}}$$

$$\frac{u'}{u} = \frac{1}{2} \times \frac{1}{(1+x)}$$

$$v = (1-x)^{-\frac{1}{2}} \Rightarrow v' = -\frac{1}{2} (1-x)^{-\frac{1}{2}-1} \times (-1) = \frac{1}{2} (1-x)^{-\frac{3}{2}} \Rightarrow$$

$$\frac{v'}{v} = \frac{1}{2} (1-x)^{-\frac{3}{2}} \bigg/ (1-x)^{-\frac{1}{2}} = \frac{1}{2} \cdot \frac{1}{(1-x)}$$

$$y = uv \Rightarrow \frac{y'}{y} = \frac{u'}{u} + \frac{v'}{v}$$

$$\therefore \frac{y'}{y} = \frac{1}{2} \cdot \frac{1}{(1+x)} + \frac{1}{2} \cdot \frac{1}{(1-x)} = \frac{1}{2} \left(\frac{1}{(1+x)} + \frac{1}{(1-x)} \right) = \frac{1}{1-x^2}$$

$$\text{ដូច្នោះ} \quad y' = y \cdot \frac{1}{1-x^2} = \sqrt{\frac{1+x}{1-x}} \cdot \frac{1}{1-x^2} = \sqrt{\frac{1+x}{(1-x)(1-x^2)^2}}$$

$$y' = \sqrt{\frac{1+x}{(1-x)(1-x^2)(1-x^2)}} = \sqrt{\frac{1}{(1-x)(1-x)(1-x^2)}} = \frac{1}{(1-x)\sqrt{1-x^2}}$$