和中鍾定捌

ex.5 已知 $x, x+1, 2x-3$ 為一直角△三邊長，求 x

$$\begin{cases} x^2+(x+1)^2=(2x-3)^2 \\ \text{or } x^2+(2x-3)^2=(x+1)^2 \\ \text{or } (x+1)^2+(2x-3)^2=x^2 \end{cases}$$

$$\Rightarrow \begin{cases} 2x^2+2x+1=4x^2-12x+9 \\ \text{or } 5x^2-12x+9=x^2+2x+1 \\ \text{or } 5x^2-10x+10=x^2 \end{cases}$$

$$\Rightarrow \begin{cases} 2x^2-14x+8=0 \\ \text{or } 4x^2-14x+8=0 \\ \text{or } 4x^2-10x+10=0 \end{cases}$$

$$\Rightarrow \begin{cases} x^2-7x+4=0 \\ \text{or } 2x^2-7x+4=0 \\ \text{or } 2x^2-5x+5=0 \end{cases}$$

$$\Rightarrow \begin{cases} x=\frac{7\pm\sqrt{49-16}}{2}=\frac{7\pm\sqrt{33}}{2} \Rightarrow \text{負不合}, x=\frac{7+\sqrt{33}}{2} \# \\ \text{or } x=\frac{7\pm\sqrt{49-32}}{4}=\frac{7\pm\sqrt{17}}{4} \Rightarrow \text{負不合}, x=\frac{7+\sqrt{17}}{4} \# \\ \text{or } x=\frac{5\pm\sqrt{25-40}}{4}=\frac{5\pm\sqrt{-15}}{4} \Rightarrow \text{無}\mathbb{R}\text{解} \end{cases}$$