

2. (1) $\sin B = \frac{3}{5} = \frac{\overline{AD}}{10} \Rightarrow \overline{AD} = 10 \times \frac{3}{5} = 6$.

(2) $\overline{BD} = 10 \times \cos B = 10 \times \frac{4}{5} = 8$

又 $\sin C = \frac{1}{\sqrt{5}} \Rightarrow \tan C = \frac{1}{2} \Rightarrow \frac{\overline{AD}}{\overline{CD}} = \frac{1}{2} \Rightarrow \overline{CD} = 2\overline{AD} = 2 \times 6 = 12$

$\Rightarrow \overline{BC} = \overline{BD} + \overline{CD} = 8 + 12 = 20$.

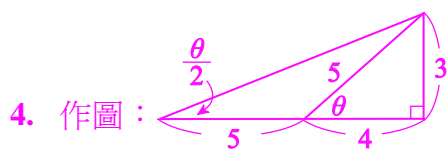
【對應課本 P.5】

3. $\overline{AE} = 16$, $\overline{AD} = 16 \cos 45^\circ = 16 \times \frac{\sqrt{2}}{2} = 8\sqrt{2}$,

$\overline{AC} = \overline{AD} \times \cos 60^\circ = 8\sqrt{2} \times \frac{1}{2} = 4\sqrt{2}$,

$\overline{BC} = \overline{AC} \times \sin 30^\circ = 4\sqrt{2} \times \frac{1}{2} = 2\sqrt{2}$.

【對應課本 P.3】



$\tan \frac{\theta}{2} = \frac{3}{5+4} = \frac{1}{3}$.

【對應課本 P.5】

5. 原式 = $\frac{\cos^2 15^\circ}{\sin^2 15^\circ} - \frac{1}{\sin^2 15^\circ} = \frac{\cos^2 15^\circ - 1}{\sin^2 15^\circ} = \frac{-\sin^2 15^\circ}{\sin^2 15^\circ} = -1$.

【對應課本 P.8, P.9】

四. 計算與證明題

1. 將 $\cos \theta = 2 \sin \theta + \frac{2}{5}$ 代入 $\sin^2 \theta + \cos^2 \theta = 1$, 整理得

$125 \sin^2 \theta + 40 \sin \theta - 21 = 0 \Rightarrow (25 \sin \theta - 7)(5 \sin \theta + 3) = 0$

$\Rightarrow \sin \theta = \frac{7}{25}$ 或 $-\frac{3}{5}$ ($-\frac{3}{5}$ 不合, $\because \theta$ 為銳角)

又 $\cos \theta = 2 \times \frac{7}{25} + \frac{2}{5} = \frac{24}{25}$.

【對應課本 P.8】

2. 左式 = $\frac{\cos \theta(1 + \sin \theta) - \cos \theta(1 - \sin \theta)}{(1 - \sin \theta)(1 + \sin \theta)} = \frac{2 \sin \theta \cos \theta}{1 - \sin^2 \theta}$

$= \frac{2 \sin \theta \cos \theta}{\cos^2 \theta} = 2 \times \frac{\sin \theta}{\cos \theta} = 2 \tan \theta$.

【對應課本 P.8, P.9】