

$$360 - 207 = 153 \checkmark$$

1. (ان) $6^\circ 19' = 6.3167^\circ$
 $6^\circ + 49.50' = 153^\circ$
 -2
 $\frac{54}{2} = 27^\circ$

$$30 + 30 + 9 + 12 = 81$$

$$|5.5 \times 18 - 30 \times 6| = 81^\circ$$

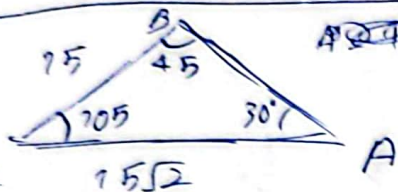
$\frac{18}{2} = 9^\circ$

$\frac{\alpha}{2} R = \frac{30}{2} = 15$ (من)
 $\alpha R + 2R = \frac{30}{2} + 6$
 $= 15 + 6$ ✓ (✓)

$$a = \sqrt{c^2 + b^2 - 2bc \cos A} = \sqrt{9 + 25 - 2 \cdot 3 \cdot 5 \cdot \frac{1}{2}} = \sqrt{19} \quad (\leftarrow)$$

$$\Rightarrow a = \sqrt{19} \quad a + b + c = 8 + 5 + \sqrt{19} = 13 + \sqrt{19}$$

$$S = \frac{1}{2} ab \sin C = \frac{1}{2} \cdot 5 \cdot 8 \cdot \sin 60 = \frac{20\sqrt{3}}{2} = 10\sqrt{3}$$



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C} \Rightarrow \frac{15}{\sin 30^\circ} = \frac{b}{\sin 45^\circ} = \frac{c}{\sin 105^\circ}$$

$$\sin 45^\circ = \frac{\sqrt{2}}{2} \Rightarrow b = 45^\circ \quad c = 180 - 30 + 45 = 105^\circ$$

$$\frac{\text{Rad}}{\pi} = \frac{1}{180} \Rightarrow \left(\frac{45}{180} = \frac{\text{Rad}}{\pi} \Rightarrow b = \frac{\pi}{4}, C = \frac{105}{180} = \frac{\text{Rad}}{\pi} \Rightarrow \text{Rad} = \frac{7\pi}{12} \right)$$

$$\frac{\tan(\pi - \alpha) + 3\tan(\pi + \alpha)}{\tan(2\pi - \alpha) - \tan(2\pi + \alpha)} = \frac{-\tan\alpha + 3\tan\alpha}{-\tan\alpha - \tan\alpha} = \frac{2\tan\alpha}{-2\tan\alpha} = -1$$

$$\tan 75 = \frac{6 + \sqrt{3}}{12}, \tan 105 = -\frac{6 + \sqrt{3}}{12}, \tan 165 = -\tan \frac{\pi}{12} \text{ so } 255 = \frac{6 + \sqrt{3}}{12}$$

$$A = \frac{2 \tan 75^\circ + \tan 70.5^\circ}{3 \tan 75^\circ - \tan 29.5^\circ} = \frac{2 \tan \frac{\pi}{4} + \tan \frac{\pi}{9}}{3 \tan \frac{\pi}{4} - \tan \frac{\pi}{9}} \Rightarrow A = \frac{\frac{1}{a}}{-3a - \frac{1}{a}} = \frac{1}{-3a^2 - 1} = -\frac{1}{3a^2 + 1} \checkmark$$

$$\frac{\sin x \cos x}{\sin x - \cos x} + \frac{\sin x - \cos x}{\sin x + \cos x} = 3 \rightarrow \frac{(\sin x + \cos x)^2 (\sin x - \cos x)^2}{\sin^2 x - \cos^2 x} = 3 \quad \text{--- 8}$$

$$\Rightarrow \frac{\sin^2 z + \sin^2 z}{\sin^2 z + 1 + \sin^2 z} = \frac{2}{2\sin^2 z + 1} = 3 \Rightarrow 2 = 6\sin^2 z + 3 \Rightarrow \sin^2 z = \frac{5}{6}$$

$$\Rightarrow \cos^2 \alpha = \frac{1}{6} \Rightarrow \tan^2 \alpha = 5$$

$$\Rightarrow \cos^2 \alpha = \frac{2}{7} \Rightarrow \sin^2 \alpha = \frac{5}{7} \Rightarrow \tan^2 \alpha = \frac{5}{2} \Rightarrow \tan \alpha = \sqrt{\frac{5}{2}} \Rightarrow \alpha = \tan^{-1} \sqrt{\frac{5}{2}} \Rightarrow \alpha = 51.10^\circ$$

$$\sqrt{\frac{1+6545}{2}} = \sqrt{\frac{2+\sqrt{2}}{2}} = \sqrt{\frac{2+\sqrt{2}}{4}} \Rightarrow \frac{2+\sqrt{2}}{2} \checkmark \Rightarrow \sin^2 \alpha = \frac{1-\cos 2\alpha}{2} \Rightarrow \sqrt{\frac{1-\cos 735^\circ}{2}} = \sin 167.5^\circ$$

$$\Rightarrow \sqrt{\frac{1 \pm \sqrt{5}}{2}} = \sqrt{\frac{2 \pm \sqrt{5}}{4}} = \frac{\sqrt{2 \pm \sqrt{5}}}{2} \quad \checkmark$$

