

الف) $(\frac{\sqrt{2}}{2}, \frac{\sqrt{3}}{2}) (\frac{1}{2}, \frac{\sqrt{3}}{2}) = \frac{2}{4} - \frac{3}{4} = -\frac{1}{4}$ ✓

ب) $\frac{1 + \frac{1}{\sqrt{3}}}{\frac{3}{2} + 1} = \frac{2}{5} = \frac{1}{2.5}$ ✓

الف) $AH = \sqrt{2} \times \frac{\sqrt{2}}{2} = \frac{\sqrt{2}}{2} = \sqrt{2} \rightarrow \hat{C} = 30^\circ \rightarrow \frac{\sqrt{2}}{2} \times \sqrt{3} = \sqrt{3}$
 $\boxed{AC = \sqrt{3}}$ ✓

ب) $AC = \frac{1}{\frac{\sqrt{3}}{2}} = \frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3} \rightarrow AH = \frac{2\sqrt{3}}{3} \times \frac{1}{2} = \frac{\sqrt{3}}{3} \rightarrow \sin B = \frac{\frac{\sqrt{3}}{3}}{\frac{2\sqrt{3}}{3}} = \frac{1}{2}$
 $\rightarrow \frac{1}{2} = \frac{\sqrt{2}}{2} \rightarrow \boxed{\hat{B} = 45^\circ}$ ✓

الف) $\frac{100\sqrt{3}}{\frac{1}{2}} = 100\sqrt{3} = AD \rightarrow BD = 100\sqrt{3} \times \frac{1}{2} = 50$

$\rightarrow AC = \frac{100\sqrt{3}}{\frac{1}{2}} = 100\sqrt{3} \rightarrow BC = 100\sqrt{3} \times \frac{\sqrt{3}}{2} = 150$

$\rightarrow \boxed{x = 150 - 50 = 100}$ ✓ $\rightarrow PC = 1 + 1^2 = \sqrt{2} \rightarrow DC = \sqrt{2}$

ب) $AC = \frac{2}{\frac{1}{2}} = 4 \rightarrow BC = 4 \times \frac{\sqrt{3}}{2} = 2\sqrt{3} \rightarrow \boxed{\sin A = \frac{1}{\sqrt{3}}}$ ✓

$AB \times AC \times \frac{1}{2} \times \frac{\sqrt{2}}{2} = c \times b \times \frac{\sqrt{2}}{2} = S_{ABC}$

$\cancel{AB} \times \cancel{AC} \times \frac{1}{2} \times \frac{1}{2} = a \times b \times \frac{1}{2} = S_{ABC}$

$\rightarrow a = \sqrt{2} \quad b = \frac{b \times a}{a}$

$\frac{S_{ADE}}{S_{BDC}} = \frac{\frac{1}{2} \times 1 \times 1 \times \sin 60^\circ}{\frac{1}{2} \times 2 \times 2 \times \sin 60^\circ} = \frac{1}{4} = \frac{1}{4}$ ✓

$AC = a \rightarrow \begin{cases} AH^2 + HC^2 = a^2 \\ AH = CH = \frac{2\sqrt{2}}{2} \end{cases}$

$\tan 30^\circ = \frac{\frac{2\sqrt{2}}{2}}{BH} \rightarrow BH = \frac{\frac{2\sqrt{2}}{2}}{\frac{1}{\sqrt{3}}} = \frac{2\sqrt{6}}{2} \rightarrow AB = BH + AH = \frac{2\sqrt{6}}{2} + \frac{2\sqrt{2}}{2}$

$\frac{AB}{AC} = \frac{a(\sqrt{6} + \sqrt{2})}{2a} = \frac{\sqrt{6} + \sqrt{2}}{2}$

$$1) \quad \sqrt{x} \cdot \frac{\sqrt{x}}{x} = \sqrt{x} \quad \checkmark$$

2

$$2) \quad \sqrt{x} \cdot \frac{\sqrt{x}}{x} \cdot \frac{1}{x} = \frac{\sqrt{x}}{x} \quad \checkmark$$

6

$$m = \tan 135^\circ = -\sqrt{3} \rightarrow y = -\sqrt{3}x + b$$

$$y = mx + \frac{a}{m} \rightarrow b = \frac{a}{m}$$

$$\rightarrow mb = \frac{-a\sqrt{3}}{1} \rightarrow \underline{1} \text{ سوال}$$

2

7

$$f\left(\frac{2\pi}{3}\right) = \cos\left(\pi + \frac{2\pi}{3}\right) + \sin\left(\frac{\pi}{3} - \frac{2\pi}{3}\right) - \tan\left(\frac{\pi}{3} + \frac{2\pi}{3}\right)$$

$$\text{سوال 1} \rightarrow \tan \theta = \frac{r}{r+1} = \frac{1}{2} \rightarrow \frac{\sin \theta}{\cos \theta} = \frac{1}{2} \rightarrow \cos \theta = \frac{2}{\sqrt{5}}$$

$$\frac{1}{2}$$

$$\rightarrow \boxed{\cos \theta = \frac{2\sqrt{5}}{5}} \quad \text{سوال 1}$$

2

8

$$f\left(\frac{2\pi}{3}\right) = \cos\left(\pi + \frac{2\pi}{3}\right) + \sin\left(\frac{\pi}{3} - \frac{2\pi}{3}\right) - \tan\left(\frac{\pi}{3} + \frac{2\pi}{3}\right)$$

$$f(120^\circ) = \cos(300^\circ) + \sin(-60^\circ) - \tan(180^\circ)$$

2

9

$$f(120^\circ) = \frac{\sqrt{3}}{2} - \frac{1}{2} - 0 = \boxed{\frac{\sqrt{3}-1}{2}} \quad \checkmark$$

$$\frac{\cos n - \sin n}{-\cos n + \sin n} = \frac{(\cos n - \sin n)}{-(\cos n - \sin n)} = \boxed{-1}$$

2

10