

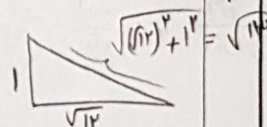
الف) $\left(\frac{\sqrt{2}}{2} + -\frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2} - (-\frac{\sqrt{3}}{2})\right) = \left(\frac{\sqrt{2}-\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}+\sqrt{3}}{2}\right) = \frac{-1}{4}$

ب) $\frac{1 + 3\left(\frac{\sqrt{3}}{3}\right)^2}{4\left(\frac{\sqrt{3}}{3}\right)^2 + 2\left(-\frac{\sqrt{2}}{2}\right)^2} = \frac{1 + 3\left(\frac{3}{9}\right)}{4\left(\frac{3}{9}\right) + 2\left(\frac{2}{4}\right)} = \frac{2}{4} = \frac{1}{2}$

الف) $\sin 45^\circ = \frac{\sqrt{2}}{2} = \frac{AH}{AB} = \frac{AH}{\sqrt{4}} \Rightarrow AH = \sqrt{2}$
 $HC = 3$
 $AH^2 + HC^2 = AC^2 \Rightarrow AC^2 - AH^2 = HC^2 \Rightarrow (2\sqrt{2})^2 - (\sqrt{2})^2 = HC^2 = 9$
 ب) $\cos 30^\circ = \frac{\sqrt{3}}{2} = \frac{9}{AC} \Rightarrow AC = 4\sqrt{3}$ $\sin B = \frac{AH}{AB} = \frac{2\sqrt{2}}{4\sqrt{3}} = \frac{\sqrt{2}}{2} \Rightarrow \hat{B} = 45^\circ$
 $AC^2 = HC^2 + AH^2 \Rightarrow (4\sqrt{3})^2 = 9^2 + AH^2 \Rightarrow AH = 3\sqrt{3}$

الف) $\tan 40^\circ = \frac{\text{مقابل}}{\text{جوار}} = \sqrt{3} = \frac{50\sqrt{3}}{BD} \Rightarrow BD = 50$ $\tan 30^\circ = \frac{\text{مقابل}}{\text{جوار}} = \frac{\sqrt{3}}{2} = \frac{50\sqrt{3}}{50+n} \Rightarrow$
 $n = 100$

ب) $\hat{C} = 30^\circ \Rightarrow \tan 30^\circ = \frac{\sqrt{3}}{3} = \frac{1}{BC} \Rightarrow BC = \sqrt{3}$
 $\sin \alpha = \frac{\text{مقابل}}{\text{مقابل}} = \frac{BD}{DC} = \frac{1}{\sqrt{3}} = \frac{\sqrt{3}}{3}$



$\sin 45^\circ = \frac{CH}{AC} = \frac{\sqrt{2}}{2} \Rightarrow CH = \frac{\sqrt{2}}{2} AC$
 $\cos 45^\circ = \frac{AH}{AC} = \frac{\sqrt{2}}{2} \Rightarrow AH = \frac{\sqrt{2}}{2} AC$

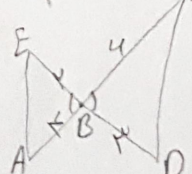
$\frac{AB}{AC} = \frac{\frac{\sqrt{2}}{2} AC + \frac{\sqrt{2}}{2} AC}{AC} = \frac{\sqrt{2} + \sqrt{2}}{2}$

$\cos 40^\circ = \frac{CH}{CB} = \frac{1}{2} \Rightarrow CB = 2CH$

$\sin 40^\circ = \frac{HB}{\sqrt{2} AC - CB} = \frac{\sqrt{2}}{2} \Rightarrow HB = \frac{\sqrt{2}}{2} AC$

$\frac{S_{ABE}}{S_{BCD}} = \frac{2 \times 4 \times \sin 30^\circ \times \frac{1}{2}}{4 \times 4 \times \sin 30^\circ \times \frac{1}{2}} = \frac{4}{16}$

$\hat{B}_1 = \hat{B}_2 \Rightarrow \sin \hat{B}_1 = \sin \hat{B}_2$



$$r \times \left(\frac{1}{r} \times r \times r \times \frac{\sqrt{r}}{r} \right) = 4\sqrt{r}$$

الف) $r \times r \times \sin 150^\circ = r \times r \times \frac{\sqrt{r}}{r} = 4\sqrt{r}$

ب) $r \times r \times \frac{\sin 150^\circ}{\frac{\sqrt{r}}{r}} \times \frac{1}{r} = r\sqrt{r}$

$$y = ax + b$$

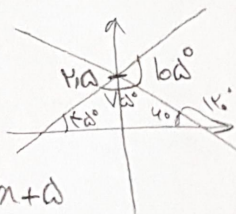
(13, 4) $4 = 13a + b$

(-1, 2) $2 = -a + b$ (*)

$$\cos \theta = \frac{r}{\sqrt{a}}$$

$a = \frac{\sqrt{a}}{r} = \tan \theta = \frac{1}{r}$

(+) $4 = 13a + b$
 $2 = -a + b$
 $10 = 14a \Rightarrow a = \frac{10}{14} = \frac{5}{7}$
 $2 = -\frac{5}{7} + b \Rightarrow b = \frac{19}{7}$
 $y = \frac{5}{7}x + \frac{19}{7}$



$x = 150^\circ \Rightarrow \tan x = 1 \Rightarrow a = 1 \Rightarrow y = x + 150$
 $150 - (150 + 150) = 150$
 $150 - 150 = 150 \Rightarrow m = \tan 150^\circ = -\frac{1}{\sqrt{3}}$

$$y = mx + a$$

$$y = mx + b$$

$$y = x + 150$$

$$b = 150$$

$mb = -\sqrt{3} \Rightarrow 150 = -\frac{1}{\sqrt{3}} \times 150 \times \sqrt{3}$

$$f(x) = -\cos x + \cos x - (-\cot x) = +\cot x$$

$$f\left(\frac{5\pi}{4}\right) = f\left(\frac{5 \times 180^\circ}{4}\right) = f(225^\circ) = \cot 225^\circ = -\sqrt{3}$$

$$\frac{+\cos x - \sin x}{-\cos x + \sin x} = -1$$