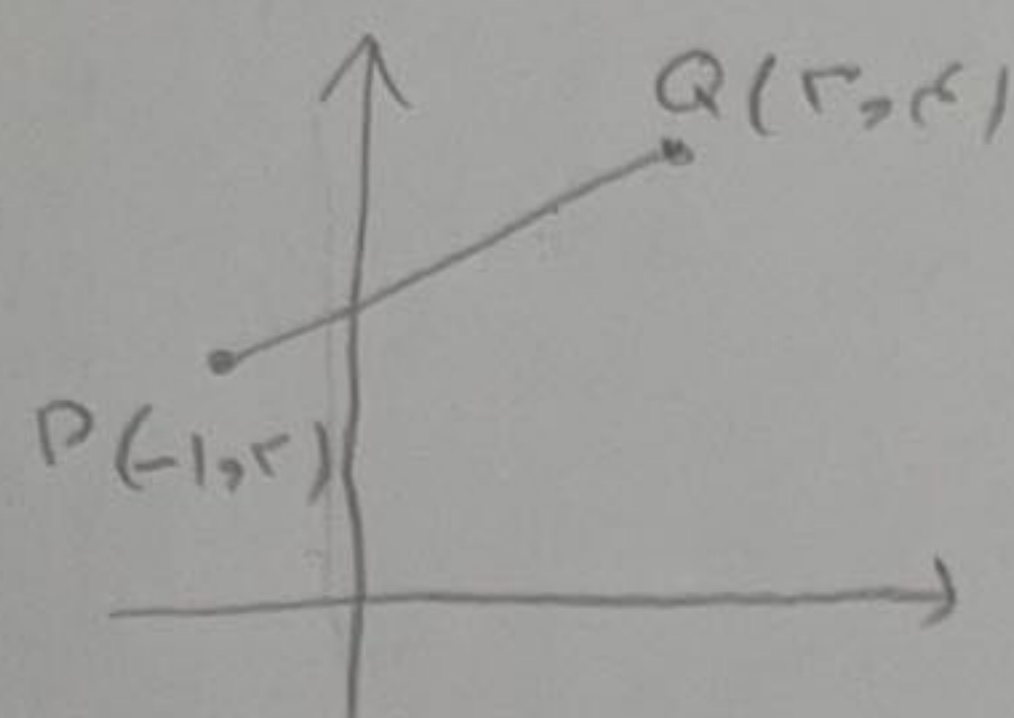
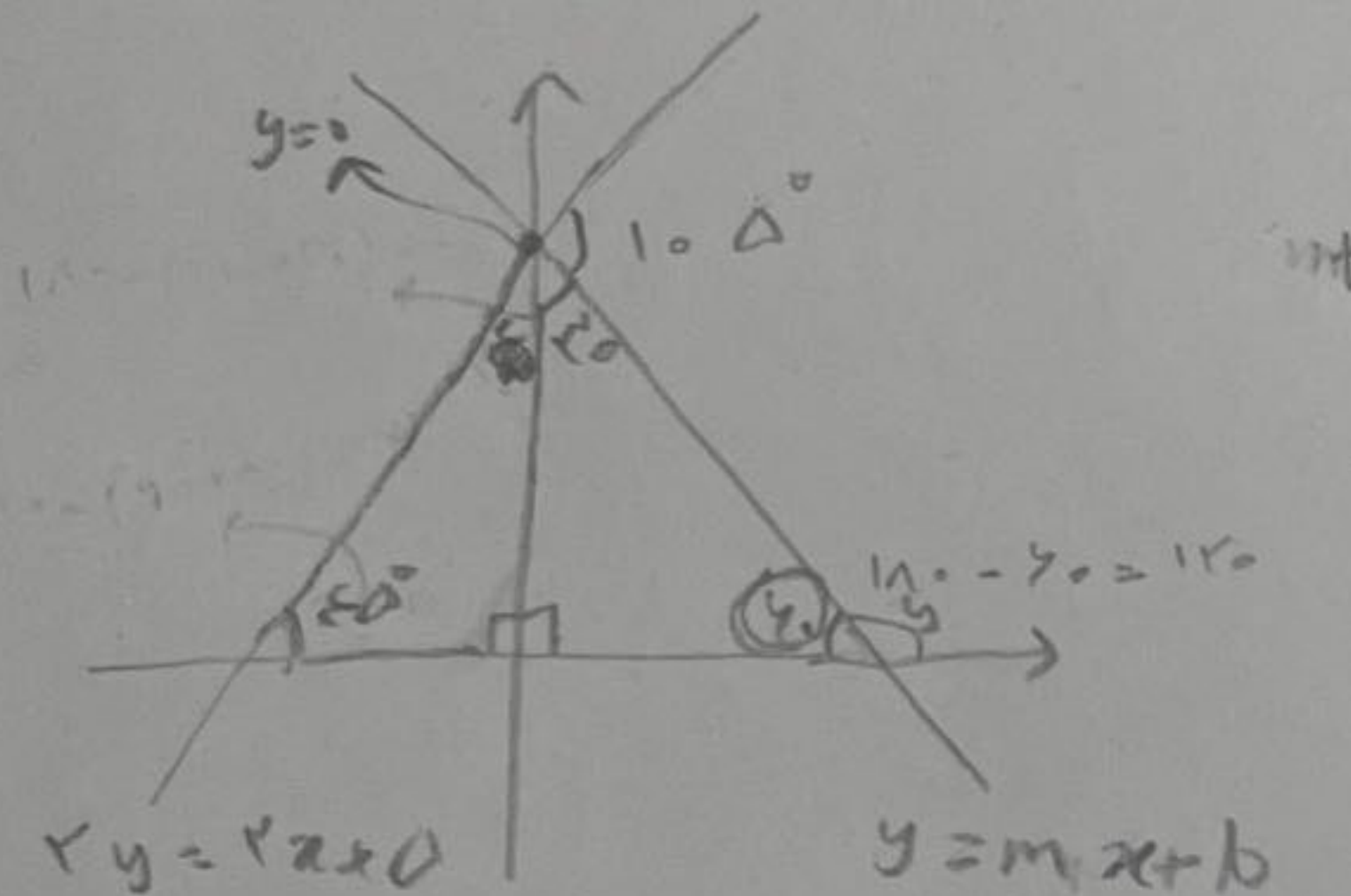


|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                                                                                                                                                                                                                                            |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(الف)</p> $(\sin 135^\circ + \sin 225^\circ)(\cos 135^\circ - \cos 225^\circ)$ $\left(\frac{\sqrt{2}}{2} + \left(-\frac{\sqrt{2}}{2}\right)\right)\left(\frac{\sqrt{2}}{2} - \left(-\frac{\sqrt{2}}{2}\right)\right)$ $= \frac{2}{4} - \frac{2}{4} = -\frac{1}{2}$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>(ب)</p> $\frac{1 + 2 \tan^2 22.5^\circ}{2 \cos^2 22.5^\circ + 2 \cos^2 22.5^\circ}$ $= \frac{1 + 2 \left(\frac{\sqrt{2}}{2}\right)^2}{2 \left(-\frac{1}{2}\right)^2 + 2 \left(-\frac{\sqrt{2}}{2}\right)^2} = \frac{1 + 2 \left(\frac{1}{2}\right)}{2 \left(\frac{1}{4}\right) + 2 \left(\frac{1}{2}\right)}$ $= \frac{1 + 1}{1 + 1} = \frac{2}{2} = 1$ |
| <p>(الف)</p> $\sin 60^\circ = \frac{\sqrt{3}}{2} = \frac{AH}{AB} \Rightarrow \frac{AH}{\sqrt{4}} = \frac{\sqrt{3}}{2} \Rightarrow AH = \sqrt{3}$ $AH = \frac{\sqrt{3} \times \sqrt{4}}{2} = \frac{\sqrt{12}}{2} = \frac{2\sqrt{3}}{2} = \sqrt{3}$ $\sin 30^\circ = \frac{\sqrt{3}}{2\sqrt{3}} = \frac{1}{2} \rightarrow \sin 30^\circ \rightarrow 30^\circ \text{ زاویه } C$ $\cos 30^\circ = \frac{\sqrt{3}}{2} = \frac{HC}{AC} = \frac{HC}{2\sqrt{3}} \rightarrow HC = \frac{2\sqrt{3} \times \sqrt{3}}{2} = 3$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | <p>(ب)</p> $\tan 30^\circ = \frac{\sqrt{3}}{2} = \frac{AH}{CH} = \frac{AH}{9}$ $AH = \frac{9\sqrt{3}}{2} = 3\sqrt{3}$ $\frac{3\sqrt{3}}{2\sqrt{3}} = \frac{1}{2} = \frac{\sqrt{2}}{2} \rightarrow \sin 45^\circ$ $\hat{B} = 45^\circ$                                                                                                                      |
| <p>(الف)</p> $\tan 45^\circ = \sqrt{3} = \frac{5\sqrt{3}}{BD} \rightarrow BD = 5$ $\tan 60^\circ = \frac{\sqrt{3}}{2} = \frac{5\sqrt{3}}{BC} \rightarrow BC = 10$ $\angle C = \angle B = \angle D = 120^\circ - 40^\circ = 80^\circ$                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <p>(ب)</p> $\cot 45^\circ = \frac{\sqrt{3}}{2} = \frac{2}{BC} \rightarrow BC = \frac{4}{\sqrt{3}} = \frac{4\sqrt{3}}{3}$ $\tan \alpha = \frac{1}{\sqrt{3}} = \frac{2\sqrt{3}}{6} = \frac{\sqrt{3}}{3} \Rightarrow \alpha = 30^\circ$ $\sin \alpha = \frac{1}{2}$                                                                                           |
| <div style="display: flex; justify-content: space-between;"> <div style="width: 40%;"> <p> <math>180^\circ - (40^\circ + 60^\circ) = 180^\circ - 100^\circ = 80^\circ</math><br/> <math>180^\circ - 80^\circ = 100^\circ</math> </p> </div> <div style="width: 55%;"> <math display="block">\cos 45^\circ = \frac{1}{2} = \frac{BH}{BC} \Rightarrow \frac{BH}{BC} = \frac{1}{2}</math> <math display="block">\sin 45^\circ = \frac{\sqrt{2}}{2} = \frac{CH}{BC} \Rightarrow \frac{CH}{BC} = \frac{\sqrt{2}}{2}</math> <math display="block">\sin 60^\circ = \frac{\sqrt{3}}{2} = \frac{CH}{AC} \Rightarrow \frac{CH}{AC} = \frac{\sqrt{3}}{2}</math> <math display="block">\frac{\frac{CH}{BC}}{\frac{CH}{AC}} = \frac{AC}{BC} = \frac{\frac{\sqrt{2}}{2}}{\frac{\sqrt{3}}{2}} = \frac{\sqrt{2}}{\sqrt{3}} = \frac{\sqrt{6}}{3}</math> <math display="block">\frac{AC}{BC} = \frac{1}{2} \Rightarrow \frac{AC}{BC} = \frac{1}{2} \Rightarrow \frac{AC}{BC} = \frac{1}{2} \Rightarrow \frac{AC}{BC} = \frac{1}{2}</math> <math display="block">\frac{AH + BH}{AC} = \frac{\sqrt{2} + \sqrt{3}}{2}</math> </div> </div> |                                                                                                                                                                                                                                                                                                                                                            |
| <div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> </div> <div style="width: 65%;"> <p><math>\frac{S_{ABE}}{S_{BCD}} = ?</math></p> <math display="block">S_{ABE} = \frac{1}{2} \times 2 \times 2 \times \sin x = 2 \sin x</math> <math display="block">S_{BCD} = \frac{1}{2} \times 4 \times 4 \times \sin x = 8 \sin x</math> <math display="block">\frac{2 \sin x}{8 \sin x} = \frac{1}{4}</math> </div> </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | <p>5</p>                                                                                                                                                                                                                                                                                                                                                   |

|                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                              |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| <p>(الف)</p> $\frac{1}{r} \times r \times r \times \sin 120^\circ = 4 \times \sin 120^\circ = 2$ $4 \times \frac{\sqrt{3}}{2} = 2\sqrt{3}$ $\frac{1}{r} \times 2\sqrt{3} \times r = 2\sqrt{3}$ $r = 4$                                                    | <p>(ب)</p> $\frac{1}{r} \times r \times r \times \sin 120^\circ = 4 \times \sin 120^\circ = 2\sqrt{3}$ $4 \times \frac{\sqrt{3}}{2} = 2\sqrt{3}$ $\frac{1}{r} \times 2\sqrt{3} \times r = 2\sqrt{3}$ $r = 4$                                                                                                                 | 6  |
|                                                                                                                                                                         | $\tan \theta = \frac{\Delta y}{\Delta x} = \frac{4-2}{2-(-1)} = \frac{1}{1}$ $1 + \tan^2 \theta = \frac{1}{\cos^2 \theta} \rightarrow 1 + \frac{1}{1} = \frac{1}{\cos^2 \theta} \rightarrow \cos^2 \theta = \frac{1}{2}$ $\cos \theta = \sqrt{\frac{1}{2}} = \frac{\sqrt{2}}{2}$                                             | 7  |
|                                                                                                                                                                        | $2y = 2x + 4 \Rightarrow y = x + \frac{4}{2} \Rightarrow m_1 = 1$ $\tan 45^\circ = \sqrt{1} \Rightarrow m = -\tan 45^\circ = -1 \Rightarrow m = -\frac{1}{1}$ $x_0 = 0 \Rightarrow y = \frac{4}{2} \Rightarrow b = \frac{4}{2}$ $y = -\frac{1}{2}x + \frac{4}{2}$ $mb = -\frac{1}{2} \times \frac{4}{2} = -\frac{2}{2} = -1$ | 8  |
| $f(x) = \cos(\pi + x) + \sin(\frac{\pi}{2} - x) - \tan(\frac{\pi}{4} + x)$ $f(\frac{5\pi}{4}) = ?$ $f(x) = -\cos x + \cos x - (-\cot x) = \cot x$ $f(\frac{5\pi}{4}) = f(135^\circ) = \cot(135^\circ) = \frac{-\sqrt{2}}{\frac{1}{\sqrt{2}}} = -\sqrt{2}$ |                                                                                                                                                                                                                                                                                                                              | 9  |
| $\frac{\sin(\frac{14\pi}{5} + x) + \cos(\frac{14\pi}{5} - x)}{\cos(2\pi + x) - \sin(2\pi - x)}$                                                                                                                                                           | $\frac{\cos x - \sin x}{-\cos x - (-\sin x)} = \frac{\cos x - \sin x}{-\cos x + \sin x} = -1$                                                                                                                                                                                                                                | 10 |