

ا) $\rightarrow \tan\left(\frac{\pi}{4} + \frac{\pi}{4}\right) + \sin\left(\frac{\pi}{4} + \frac{\pi}{4}\right) + \cos\left(\frac{\pi}{4} + \frac{\pi}{4}\right) = \tan \frac{\pi}{2} + \sin \frac{\pi}{2} + \cos \frac{\pi}{2} = 1 + \sqrt{2} - \sqrt{2} = 1$

ب) $\rightarrow \tan\left(\frac{\pi}{4} + \frac{\pi}{4}\right) \times \sin\left(\frac{\pi}{4} + \frac{\pi}{4}\right) + \cos\left(\frac{\pi}{4} + \frac{\pi}{4}\right) = \left(\frac{1}{\sqrt{2}}\right) \times \left(\frac{\sqrt{2}}{2}\right) + \left(\frac{1}{\sqrt{2}}\right) = \frac{1}{2} + \frac{1}{\sqrt{2}} = \frac{1}{2} + \frac{\sqrt{2}}{2}$

$\rightarrow \frac{\cos \alpha}{\sin \alpha} \rightarrow \cos \alpha \div \sin \alpha \rightarrow \frac{\cos \alpha}{\sin \alpha} = \cot \alpha$

$\sin \alpha, \cos \alpha \rightarrow \tan \alpha = \frac{\sin \alpha}{\cos \alpha} \rightarrow \frac{\sin \alpha}{\cos \alpha} = \tan \alpha$

ا) $\cos\left(\frac{\pi}{2} + \alpha\right) = \cos\left(\frac{\pi}{2}\right) \times \cos \alpha - \left(\sin\left(\frac{\pi}{2}\right) \times \sin \alpha\right) = (0) \times \cos \alpha - (1 \times \sin \alpha) = -\sin \alpha$

ب) $\sin\left(\frac{\pi}{2} + \alpha\right) = \left(\sin\left(\frac{\pi}{2}\right) \times \cos \alpha\right) + \left(\cos\left(\frac{\pi}{2}\right) \times \sin \alpha\right) = (1 \times \cos \alpha) + (0 \times \sin \alpha) = \cos \alpha$

$\sin^2 \alpha + \cos^2 \alpha = 1 \rightarrow \sin^2 \alpha = 1 - \cos^2 \alpha$

$S = \frac{1}{2} ab \sin \alpha = \frac{1}{2} \times 4 \times \sqrt{3} \times \sin \alpha$

$S = ab \sin \alpha = 4 \times \sqrt{3} \times \sin \alpha$

$S_1 = S_{ABC} = \frac{1}{2} \times AB \times AC \times \sin A$

$S_2 = S_{ADE} = \frac{1}{2} \times AD \times AE \times \sin A$

$\frac{S_{ABC}}{S_{ADE}} = \frac{\frac{1}{2} \times AB \times AC \times \sin A}{\frac{1}{2} \times AD \times AE \times \sin A} = \frac{AB \times AC}{AD \times AE}$

$\Rightarrow \frac{1}{4} (BM + AM) = 9BM \rightarrow \frac{1}{4} BM + \frac{1}{4} AM = 9BM \rightarrow \frac{1}{4} AM = 9BM - \frac{1}{4} BM = \frac{35}{4} BM$

$\frac{|\sin \alpha|}{\cos \alpha} = \frac{-\sin \alpha}{\cos \alpha} \Rightarrow \sin \alpha < 0$