

نام و نام خانوادگی: پستخانه تشریحی تکلیف شماره ۱۸۱۵... کلاس: درجۀ:
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الف) $(\sin 114^\circ + \sin 120^\circ)(\cos 114^\circ - \cos 150^\circ) = \left(\frac{\sqrt{2}}{2} + \frac{\sqrt{3}}{2}\right)\left(\frac{\sqrt{2}}{2} - \frac{\sqrt{3}}{2}\right)$

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

ج) $\frac{1 + 3 \tan^2 110^\circ}{4 \cos^2 110^\circ + 2 \cos^2 120^\circ} = \frac{1 + 3 \left(\frac{\sqrt{3}}{2}\right)^2}{4 \left(\frac{\sqrt{2}}{2}\right)^2 + 2 \left(-\frac{\sqrt{2}}{2}\right)^2} = \frac{1 + 1}{4 \times \frac{2}{4} + 2 \times \frac{2}{4}} = \frac{2}{4} = \boxed{\frac{1}{2}}$

الف) $\triangle ABH: \sin 45^\circ = \frac{AH}{AB} \Rightarrow \frac{\sqrt{2}}{2} = \frac{AH}{\sqrt{2}} \Rightarrow AH = \sqrt{2}$

$\triangle AHC: AC' = AH \times HC' \Rightarrow 12 = \sqrt{2} + HC' \Rightarrow HC' = \sqrt{12 - \sqrt{2}} = \sqrt{2}$

ب) $\triangle AHC: \tan 30^\circ = \frac{AH}{HC} \Rightarrow \frac{\sqrt{2}}{2} = \frac{AH}{9} \Rightarrow AH = \frac{9 \times \sqrt{2}}{2} = 4.5\sqrt{2}$

$\Rightarrow \sin B = \frac{4.5\sqrt{2}}{9} = \frac{\sqrt{2}}{2} \Rightarrow B = 45^\circ$

الف) $\triangle ABD: \tan 40^\circ = \frac{AB}{BD} \Rightarrow \sqrt{2} = \frac{AB}{BD} \Rightarrow BD = \frac{AB}{\sqrt{2}} = \frac{2 \cdot \sqrt{2}}{\sqrt{2}} \Rightarrow BC = 100$

$\Rightarrow 11 = BC - BD = 100 - 10 = 90$

ب) $\triangle ABC: \tan 40^\circ = \frac{BC}{AB} \Rightarrow \sqrt{2} = \frac{BC}{9} \Rightarrow BC = 9\sqrt{2}$

$1 + (9\sqrt{2})^2 \Rightarrow DC = \sqrt{13} \Rightarrow \sin \alpha = \frac{1}{\sqrt{13}} = \frac{\sqrt{13}}{13}$

$\sin^2 \alpha = \frac{1 - \cos^2 \alpha}{2} \Rightarrow \sin^2 105^\circ = \frac{1 - \cos^2 110^\circ}{2} = \frac{1 + \sqrt{2}}{2} \Rightarrow \sin 105^\circ = \frac{\sqrt{1 + \sqrt{2}}}{2}$

$\frac{AB}{\sin 105^\circ} = \frac{AC}{\sin 120^\circ} \Rightarrow \frac{AB}{\sin 105^\circ} = \frac{AC}{\sin 120^\circ}$

$= \frac{\sqrt{2 + \sqrt{2}}}{2} = \boxed{\sqrt{2 + \sqrt{2}}}$

$\frac{S_{ABE}}{S_{BCD}} = \frac{\sin B \times \frac{1}{2} \times EB \times AB}{\sin B \times \frac{1}{2} \times BC \times BD} = \frac{2 \times 2}{4 \times 2} = \boxed{\frac{1}{2}}$

$B_1 = B_2$

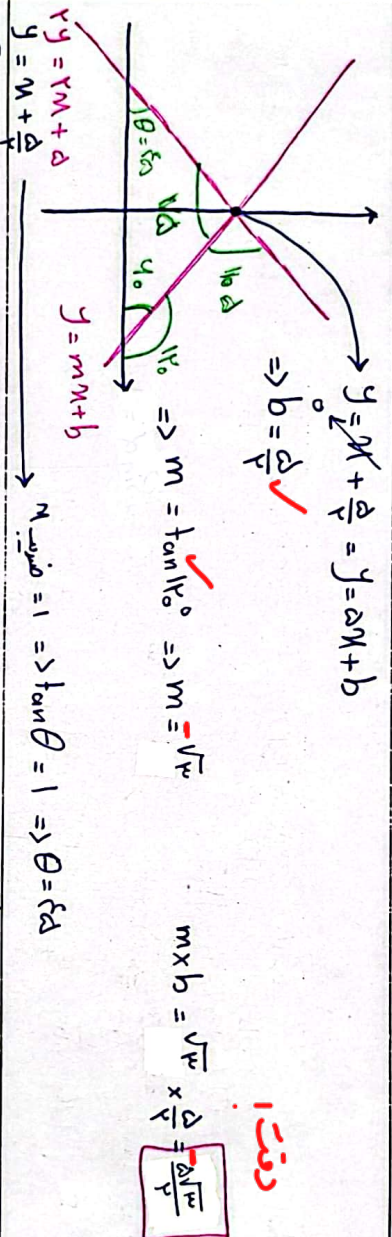
الف) $\vec{S} = \vec{S}_m \cos \theta \times \frac{1}{r} \times \frac{1}{r} = \frac{1}{r^2} \times \frac{1}{r} \times \frac{1}{r} = \frac{1}{r^3}$ ✓

ب) $\vec{S} = \vec{r} \left(\frac{1}{r} \times \vec{S}_m \cos \theta \times \frac{1}{r} \times \frac{1}{r} \right) = \frac{1}{r^3} \times \vec{r} \times \vec{S}_m \cos \theta$ ✓
 $\vec{r}$ و $\vec{S}_m$ متوازيان

$S = \frac{1}{r^3} \times r \times r \times S_m \cos \theta = \frac{S_m \cos \theta}{r}$

$\tan \theta = \frac{z - r}{r - (-1)} = \frac{1}{r}$ ← ديس خط

$\tan^2 \theta + 1 = \frac{1}{\cos^2 \theta} \Rightarrow \frac{1}{r^2} + 1 = \frac{1}{\cos^2 \theta} \Rightarrow \cos \theta = \frac{r}{\sqrt{r^2 + 1}}$ ✓



$f\left(\frac{\partial T}{\partial y}\right) = \cos\left(\frac{\partial T}{\partial y} + \pi\right) + \sin\left(\frac{\pi}{r} - \frac{\partial T}{\partial y}\right) - \tan\left(\frac{y}{r} + \frac{\partial T}{\partial y}\right)$
 $= \cos\left(\frac{\partial T}{\partial y}\right) - \cos\left(\frac{\partial T}{\partial y}\right) - \tan\left(\frac{\pi}{r}\right) = -\tan\left(\frac{\pi}{r}\right) = -\frac{1}{r}$ ✓

$\sin\left(\frac{1}{r} + \pi\right) + \cos\left(\frac{1}{r} - \pi\right) = \sin\left(\frac{\pi}{r} + \pi\right) + \cos\left(\frac{y}{r} - \pi\right)$
 $\frac{\cos(y\pi + \pi) - \sin(y\pi - \pi)}{\cos \pi - \sin \pi} = \frac{\cos(\pi + \pi) - \sin(\pi - \pi)}{-\cos \pi - \sin \pi} = \frac{-1}{-1} = 1$ ✓