

19, 8

نام و نام خانوادگی: ... آرایش الکترونی عنصر دایمونی ...
 عدد اتمی آن: ۲۵ و پنجمین عنصر دسته ۱ جدول دوره ای است.
 ۱۵: واسطه محسوب شده و هشتمین عنصر دوره سوم جدول دوره ای است.
 ۱۵: واسطه محسوب شده و هشتمین عنصر دوره سوم جدول دوره ای است.

الف) $\tan \frac{11\pi}{4} + \sin \frac{10\pi}{4} \cos \frac{13\pi}{4} = -1 + \frac{1}{4} = -\frac{3}{4}$ ✓ (۲)

ب) $\tan \frac{1\pi}{4} + \sin \frac{11\pi}{4} + \cos \frac{10\pi}{4} = \frac{1}{4} - \frac{1}{4} = 0$ ✓

$\frac{15 \cos m - \sin m}{\sin m + \cos m} = \frac{15 \sin m - \sin m}{\sin m + \cos m} = \frac{14 \sin m}{\sin m + \cos m} = \frac{14}{1} = 14$ ✓ (۲)

$\sin \alpha = 15 \cos \alpha \Rightarrow \sin^2 \alpha + \cos^2 \alpha = \cos^2 \alpha + 15^2 \cos^2 \alpha = 1 \Rightarrow \cos^2 \alpha = \frac{1}{15^2 + 1} = \frac{1}{226}$
 $\cos \alpha = -\frac{\sqrt{226}}{15}$ ✓ (۲)

$\sin \alpha = \frac{\sqrt{91}}{10} \Rightarrow \cos \alpha = \frac{\sqrt{91}}{10}$
 $\cos(\alpha + \beta) = \cos \alpha \cos \beta - \sin \alpha \sin \beta = -\frac{\sqrt{91}}{10} \times \frac{\sqrt{4}}{4} - \frac{\sqrt{91}}{10} \times \frac{\sqrt{4}}{4} = -\frac{\sqrt{91}}{10}$ ✓ (۲)

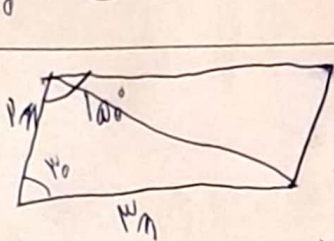
$\tan \alpha = \frac{1}{4} \Rightarrow \sin \alpha = \frac{1}{\sqrt{17}}, \cos \alpha = \frac{4}{\sqrt{17}}$
 $\sin(\alpha + \beta) = \sin \alpha \cos \beta + \sin \beta \cos \alpha = \frac{1}{\sqrt{17}} \times \frac{\sqrt{4}}{4} + \frac{4}{\sqrt{17}} \times \frac{1}{4} = \frac{5}{\sqrt{17}}$ ✓ (۲)

$15 \sin^2 \alpha + \cos^2 \alpha = \frac{15}{17} \Rightarrow \sin^2 \alpha + \sin^2 \alpha + \cos^2 \alpha = \frac{15}{17} \Rightarrow \sin^2 \alpha = \frac{1}{17} \Rightarrow \cos^2 \alpha = 1 - \frac{1}{17} = \frac{16}{17}$
 $\Rightarrow \tan \alpha = \frac{1}{4}$ ✓ (۲)

$$4 \times \sqrt{W} \times \sin \alpha = F/a$$

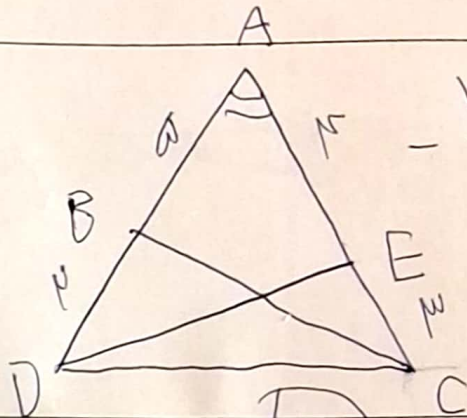
$$\sin \alpha = \frac{F/a}{4\sqrt{W}} = \frac{\sqrt{W}}{4} \Rightarrow \begin{cases} \alpha = 40^\circ \\ \alpha = 140^\circ \end{cases}$$

$$\frac{140^\circ}{40^\circ} = \textcircled{P} \checkmark$$



$$\frac{W \times W \times \sin 40^\circ}{W} = W$$

$$(W_M + W_N) \times P = 10m = W_0 \sqrt{P} \Rightarrow W_M = W \Rightarrow n^M = 1A \Rightarrow n = \frac{W \sqrt{P}}{100}$$

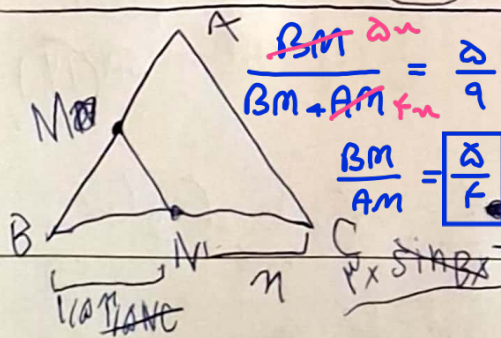


$$\frac{V \times W \times \sin A}{P} + \frac{V \times W \times \sin A}{P}$$

$$W \sin A - W \sin A = W/a$$

$$\Rightarrow \tan A = \tan 40^\circ = \frac{\sqrt{W}}{W} \checkmark$$

$$\Rightarrow \sin A = \frac{1}{P} \Rightarrow \begin{cases} A = 40^\circ \text{ or } 140^\circ \end{cases}$$



$$\frac{BM}{AM} = \frac{a}{9}$$

$$W_{NC} = W_{BN} \Rightarrow \frac{W}{NC} = \frac{W}{BN}$$

$$\Rightarrow \frac{BM}{AB} = \frac{a}{9}$$

$$\frac{W \times \sin \alpha}{W} \times BM = \frac{W \times \sin \alpha}{W} \times AB$$

$$\frac{1}{\sqrt{\cos \alpha}} - \tan \alpha = \frac{1 + \sin \alpha}{|\cos \alpha|}$$

$$\frac{|\sin \alpha|}{\cos \alpha} = -\frac{1}{\cot \alpha} = -\tan \alpha$$

$$\left| \frac{1}{\cos \alpha} \right| - \frac{\sin \alpha}{\cos \alpha} = \frac{1 + \sin \alpha}{|\cos \alpha|}$$

$$\Rightarrow \cos \alpha < 0$$

$$1 - 1 - \sin \alpha = 1 + \sin \alpha$$

$$\alpha = 140^\circ$$