آ... تمی - دهم تجربی (آوا حاتمی)

سوال 1

الف) $27^\circ = x\ rad \Rightarrow \frac{27}{180} = \frac{rad}{\pi} \rightarrow \frac{27\pi}{180} = \frac{3\pi}{20} \simeq 0/4712\ rad$

ب) $129^\circ = x\ rad \Rightarrow \frac{129}{180} = \frac{rad}{\pi} \rightarrow \frac{129\pi}{180} = \frac{43\pi}{60} \simeq 2/1817\ rad$

ج) $\frac{3\pi}{12}\ rad = x^\circ \Rightarrow \frac{3\pi}{12} = \frac{D}{180} \rightarrow \frac{180 \times 3}{12} = 75^\circ$

د) $\frac{4\pi}{9}\ rad = x^\circ \Rightarrow \frac{4\pi}{9} = \frac{D}{180} = \frac{180 \times 4}{9} = 80^\circ$

$\frac{D}{180} = \frac{G}{200} = \frac{Rad}{\pi}$

سوال 2

$10\ a^\circ$

$\frac{129}{9}\ a\ Grad \rightarrow \frac{D}{180} = \frac{\frac{129}{9}a}{\frac{200}{1}} \Rightarrow \frac{D}{180} = \frac{129}{1800}a \Rightarrow D = 12/5a$

$\frac{a\pi}{8} \Rightarrow \frac{a\pi}{\frac{8}{\pi}} = \frac{D}{180} \rightarrow \frac{a\pi}{8\pi} = \frac{D}{180} \Rightarrow D = 22/5a$

$12/5a + 22/5a + 5a = 180$

$a(12/5 + 22/5 + 5) = 180$

$a = \frac{180}{45} = 4 \Rightarrow a = 4$

سوال 3

الف) $\cos 40^\circ \cos 20^\circ - \sin 40^\circ \sin 20^\circ - \tan 45^\circ + 2\cot 45^\circ = \frac{1}{2} \times \frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2} \times \frac{1}{2} - 1 + 2 = -1 + 2 = 1$ (۲)

ب) $\dfrac{\tan^2 30^\circ + \tan^2 60^\circ + \tan^2 45^\circ}{\cot 30^\circ - \cot 45^\circ} = \dfrac{\left(\frac{1}{\sqrt{3}}\right)^2 + (1^2) + (\sqrt{3})^2}{\frac{\sqrt{3}}{1 \times \sqrt{3}} - \frac{1}{\sqrt{3}}} = \dfrac{\frac{1}{3} + 1 + 3}{\frac{3-1}{\sqrt{3}}} =$

$\Rightarrow \dfrac{\frac{1+3+9}{3}}{\frac{2}{\sqrt{3}}} = \dfrac{\frac{13}{3}\sqrt{3}}{2}$ (۷)

سوال 4 [آواحاتمی] *

$-\sin 30^\circ \cos 45^\circ + \cos 30^\circ \sin 45^\circ = \sin^2\theta \Rightarrow \frac{-1}{4} + \frac{3}{4} = \frac{2}{4} = \frac{1}{2} \rightarrow \sin^2\theta = \frac{1}{2}$

$\left(\frac{-1}{2} \times \frac{1}{2}\right) \quad \left(\frac{\sqrt{3}}{2} \times \frac{\sqrt{3}}{2}\right)$

$\sin = \frac{1}{\sqrt{2}} \times \frac{\sqrt{2}}{\sqrt{2}} = \frac{\sqrt{2}}{2} \quad \theta = 45^\circ$ (۱)

سوال 10

$\tan x = \frac{\sin x}{\cos x} = \frac{1}{3}$ در ناحیه ۳ $\Rightarrow \sin < 0 \quad \cos < 0 \quad \tan > 0$

$\sin x = \frac{1}{3}\cos x \rightarrow \sin^2 x + \cos^2 x = 1 \rightarrow \left(\frac{1}{3}\cos x\right)^2 + \cos^2 x = 1 \rightarrow \frac{1}{9}\cos^2 x + \cos^2 x = 1$

$\cos^2 x \times \frac{10}{9} = 1 \rightarrow \cos^2 x = \frac{9}{10} \Rightarrow \cos x = \pm\frac{3}{\sqrt{10}} \rightarrow \cos x = -\frac{3}{\sqrt{10}}$ (چون در ناحیه ۳ قرار دارد)

ادامه سوال ۱۵

$$\sin x = \frac{1}{3}\cos x \Rightarrow \sin x = \frac{1}{3} \times \frac{-3}{\sqrt{10}} \Rightarrow \sin x = \frac{-1}{\sqrt{10}}$$

سوال 5

$$\frac{2\tan 15^\circ\left(1-\tan^2 15^\circ\right)}{\left(1-\cot^2 40^\circ\right)^2}=\tan\theta \Rightarrow \frac{2\times\frac{1}{\sqrt{3}}\left(1-\frac{1}{3}\right)}{\left(1-\frac{1}{3}\right)^2}=\frac{\frac{2}{\sqrt{3}}\times\frac{2}{3}}{\left(\frac{2}{3}\right)^2}$$

$$\Rightarrow \frac{\frac{4}{3\sqrt{3}}}{\frac{4}{9}}=\frac{36}{12\sqrt{3}}=\frac{3\sqrt{3}}{\sqrt{3}\times\sqrt{3}}=\frac{3\sqrt{3}}{3}=\sqrt{3} \Rightarrow \tan\theta=\sqrt{3}\rightarrow \theta=60^\circ$$

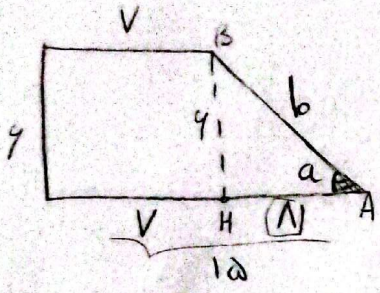
$$60\times\frac{\pi}{180}=\frac{\pi}{3}$$ ✓

سوال 6

$$\tan\theta=\frac{\sin\theta}{\cos\theta}=2 \rightarrow \sin\theta=2\cos\theta$$

$$\frac{3\sin\theta-\cos\theta}{\sin\theta-4\cos\theta}=\frac{3(2\cos\theta)-\cos\theta}{2\cos\theta-4\cos\theta}=\frac{14\cos\theta}{-2\cos\theta}=-14$$ ✓

سوال 7

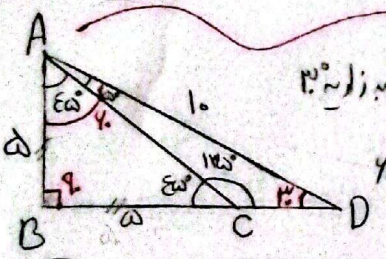


$$\sin\alpha=\frac{\text{مقابل}}{\text{وتر}}=\frac{4}{\sqrt{10}} \qquad AB^2=AH^2+BH^2$$

$$AH^2=6^2-4^2 \Rightarrow AH=8$$

$$S_{\square}=\frac{(10+2)\times 4^2}{2}=22\times 2=44$$ ✓

سوال 8



$$\text{ضلع روبه‌رو زاویه }30^\circ=\frac{1}{2}\times\text{وتر}=\frac{1}{2}\times 10=5$$

$$\text{ضلع روبه‌رو زاویه }60^\circ=\frac{\sqrt{3}}{2}\times\text{وتر}=\frac{\sqrt{3}}{2}\times 10=5\sqrt{3}$$

$$\Rightarrow CD=5\sqrt{3}-5$$ ✓

سوال 9

الف) $4\times$ نقط در ربع (ناحیه ۳) $\sin^2 30^\circ$ هستش، $\cos$ افزایشی می‌باید

ناحیه ۱ : $\sin\uparrow \cos\downarrow$

ناحیه ۲ : $\sin\downarrow \cos\downarrow$

ناحیه ۳ : $\sin\downarrow \cos\uparrow$

ناحیه ۴ : $\sin\uparrow \cos\uparrow$

$\Leftarrow$ افزایش زاویه θ

ب) $4\times$ نقط در ربع (ناحیه ۲) $\sin 20^\circ$، $\cos$ هردو کاهشی می‌باشد

* سوال ۱۰ در صفحه اول نوشته شده!!