آزمون ۱۷ - مثلثات - پایه ...

①- گزینه ۳

$$=\frac{\sin(180^\circ-20^\circ)-\cos(180^\circ+20^\circ)}{\cos(90+20^\circ)+\sin(90-20^\circ)}=\frac{\sin20+\cos20}{-\sin20+\cos20}\ \frac{\div\cos20}{\div\cos20}\ \frac{\tan20+1}{-\tan20+1}$$

$$=\frac{0/36+1}{-0/36+1}=\frac{1/36}{0/64}=\frac{17}{8}$$

نکته: $\alpha+\beta=\pi \rightarrow \cos\alpha+\cos\beta=0$

②- ۲

$$\cos\frac{3\pi}{14}+\cos\frac{5\pi}{14}+\cos\frac{7\pi}{14}+\cos\frac{9\pi}{14}+\cos\frac{11\pi}{14}=0$$

صفر — صفر — صفر

③- ۳

$$\frac{\sin(270-20^\circ)+\sin(720-20^\circ)}{\cos(3\times180+20)-\cos(90+20^\circ)}=\frac{-\cos20-\sin20}{-\cos20+\sin20}\ \frac{\div\cos20}{\div\cos20}\ \frac{-1-\tan20}{-1+\tan20}$$

($720 = 2\times360$)

$$=\frac{-1-0/4}{-1+0/4}=\frac{-1/4}{-0/6}=\frac{14}{6}=\frac{7}{3}$$

$$\frac{\tan15+1}{\tan15-1}=\frac{0/28+1}{0/28-1}=\frac{1/28}{-0/72}=\frac{-16}{9}$$

④- ۱

$$\frac{\cos(270^\circ+15^\circ)-\sin(270-15^\circ)}{\sin(3\times180^\circ-15^\circ)-\sin(90+15^\circ)}=\frac{+\sin15^\circ+\cos15^\circ}{\sin15^\circ-\cos15}\ \frac{\div\cos15}{\div\cos15}$$

⑤- ۴

$$\frac{\sin\theta+\cos\theta}{\sin\theta+\sin\theta}\ \frac{\div\cos\theta}{\div\cos\theta}\ \frac{\tan\theta+1}{2\tan\theta}=\frac{0/2+1}{2(0/2)}=\frac{1/2}{0/4}=3$$

⑥- ۴

$r^2=x^2+y^2$ ربع ۳ θ ، $r=5$

$\cot\theta=\frac{x}{y}=\frac{-4}{-3}$

$$0-\sin\theta+\cos\theta=\text{[illegible]}=\frac{3}{5}-\frac{4}{5}=-\frac{1}{5}$$

ربع ۳ $P\begin{cases}-4=x\\-3=y\end{cases}$ ، $r=5$ ، $\sin\theta=\frac{-3}{5}$ ، $\cos\theta=-\frac{4}{5}$

⑦- ۱

$$\sin\left(\frac{3\pi}{2}-\alpha\right)=-\cos\alpha=-\sqrt{1-\sin^2\alpha}=-\sqrt{1-\frac{8}{9}}=\frac{-1}{3}$$

ربع ۱

⑧- ۳

ربع ۳ x ، $\cos x=-\frac{\sqrt{10}}{10}$ ، $\sin x=-\sqrt{1-\frac{10}{100}}=-\frac{3\sqrt{10}}{10}$

$$\tan\left(\frac{3\pi}{2}-x\right)=\cot x=\frac{\cos x}{\dots}=\frac{-\frac{\sqrt{10}}{10}}{\dots}=\frac{1}{\dots}$$

⑨-۲ $\frac{\omega\pi}{12} = 75^\circ$ $\quad \begin{cases} x+y=75^\circ \\ x-y=15^\circ \end{cases} \rightarrow 2x=90^\circ \rightarrow x=45^\circ = \frac{\pi}{4}$

* $\frac{D}{180} = \frac{R}{\pi}$

⑩-۴ $\frac{D}{180} = \frac{3}{\pi} \rightarrow D = \frac{3\times 180}{3.14} \simeq 171.9 \sim 172^\circ$

توجه $1\,rad \simeq 57.3^\circ \xrightarrow{\times 3} 172^\circ$

** $\frac{5\pi}{6} = 150^\circ$

⑪-۲ $x+2x+3x=180^\circ \rightarrow 6x=180^\circ \rightarrow x=30^\circ$

$3x-x=2x=2\times 30=60^\circ$

⑫-۴ $540-140=220^\circ$ $\quad \frac{220}{180} = \frac{R}{\pi} \rightarrow R = \frac{11\pi}{9}$

$\overset{\frown}{AMB} = L = R\cdot\theta = 5\times\frac{11\pi}{9} = \frac{55\pi}{9}$ * از رسم دایره هم می‌توان کمک گرفت

⑬-۲ $\overset{\frown}{AM} = \frac{7\pi}{12} = 105^\circ$ $\quad \overset{\frown}{MN} = \overset{\frown}{AN} - \overset{\frown}{AM} = 225-105 = 120^\circ$

$\overset{\frown}{NP} = \overset{\frown}{AP} - \overset{\frown}{AN} = 360-225 = 120^\circ \Rightarrow \overset{\frown}{MA} = 120^\circ \Rightarrow \hat{M}=\hat{N}=\hat{P} = \frac{120}{2} = 60^\circ$

⑭-۴ $\sin\alpha = \frac{2}{x}$ $\quad \cot\alpha = \frac{y}{3}$ ، $1+\cot^2\alpha = \frac{1}{\sin^2\alpha}$

$\rightarrow 1+\frac{y^2}{9} = \frac{x^2}{4}$) $\times 36 \rightarrow$ $\underline{4y^2+9y^2=9x^2}$

⑮-۱ $\tan x = \frac{2}{4} = \frac{y}{x}$ از A به r $\quad r = \sqrt{9+4} = \sqrt{13} \rightarrow \sin x = \frac{2}{\sqrt{13}}$

$\cos x = \frac{3}{\sqrt{13}} \Rightarrow A = \frac{4}{\sin x} + \frac{2}{\cos x} + \frac{3\sin x}{\cos x} = \frac{4\sqrt{13}}{2} + \frac{2\sqrt{13}}{3} + 3\times\frac{2}{3} = 2 + \frac{8\sqrt{13}}{3}$

⑯-۱ $= \tan(180-30^\circ) + \cot(\pi+\frac{\pi}{3}) = -\tan 30^\circ + \cot 60^\circ = -\frac{\sqrt{3}}{3} + \frac{\sqrt{3}}{3} = 0$

⑰-۲ $\alpha+\beta = \frac{\pi}{2} \rightarrow 2x-\frac{\pi}{10} + 3x+\frac{3\pi}{10} = \frac{\pi}{2} \Rightarrow 5x = \frac{\pi}{2} - \frac{2\pi}{10} = \frac{11\pi}{20}$

$\Rightarrow x = \frac{11\pi}{100}$

⑱-۳ $\tan(110\pi+\frac{3\pi}{2}-x) = \cot x = \frac{\cos x}{\sin x} = \frac{-\sqrt{10}}{-3\sqrt{10}} = \frac{1}{3}$ مثل سوال ⑧

(۲۰)- ۱ $\sin(6\pi + \frac{3\pi}{2} - \alpha) = -\cos\alpha = -\sqrt{1-\sin^2\alpha} = -\sqrt{1-\frac{8}{9}} = -\frac{1}{3}$

(۲۱)- ۳ $\tan\theta = \frac{0+1}{0-1} = -1$ $\tan\frac{\pi}{4} = \tan\frac{5\pi}{4} = \tan\frac{21\pi}{4} = 1$ *

(۲۲) ۳ $-\frac{1}{2} - \frac{\sqrt{3}}{2}\tan\theta = 0 \rightarrow \tan\theta = -\frac{1}{\sqrt{3}} = -\frac{\sqrt{3}}{3} \leftarrow \tan\frac{11\pi}{6}$

(۲۳) ۱ $0+0+0+0+\cos(18\pi - \frac{\pi}{4}) - \sin(12\pi - \frac{\pi}{4}) =$

$\cos\frac{\pi}{4} - \sin\frac{\pi}{4} = \frac{\sqrt{2}}{2} - \frac{\sqrt{2}}{2} = 0$

(۲۴) ۴ $A = \frac{2\times\frac{1}{2}\times(-1) - 4(-\sqrt{3})(-\frac{\sqrt{3}}{2}) + 0}{(-\sqrt{3})^2(\frac{1}{2}) + 0} = \frac{-1-6}{\frac{3}{2}} = -\frac{14}{3}$

(۲۵) ۳ نمودار Max $\rightarrow y=2 \rightarrow a=2$ شکل $T=6=\frac{2\pi}{|b\pi|} \rightarrow b=\frac{1}{3}$

$a+b = 2+\frac{1}{3} = \frac{7}{3}$

(۱۴) ۱ $A^2 = (\sin x + \cos x)^2 = \sin^2 x + \cos^2 x + 2\sin x\cos x = 1 + 2(-\frac{1}{4}) = \frac{2}{4}$

اگر * $\frac{3\pi}{4} < x < \pi \rightarrow \sin x + \cos x < 0 \longrightarrow A = -\frac{\sqrt{2}}{2}$