

کتاب حساب / دایره و دایره

18, 20

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تالیف 12

$$\frac{a \sin \frac{24}{15} + b \cos \frac{11}{4}}{a \sin \frac{11}{4} + b \cos \frac{24}{15}} = \tan \frac{18}{4} \Rightarrow \frac{ax - \frac{\sqrt{2}}{2} + bx - \frac{\sqrt{2}}{2}}{ax - \frac{1}{2} + bx + \frac{1}{2}} = -\frac{\sqrt{2}}{2}$$

$$\Rightarrow \frac{-\frac{\sqrt{2}}{2}(a+b)}{-\frac{1}{2}(a-b)} = -\frac{\sqrt{2}}{2} \Rightarrow \frac{a+b}{a-b} = -\frac{\sqrt{2}}{2} \times \frac{1}{\frac{1}{2}} \times \frac{2}{\sqrt{2}} = -\frac{1}{2}$$

$$\begin{cases} a+b = -x \\ a-b = +x \end{cases} \Rightarrow 2a = 2x \rightarrow a = x \text{ و } b = -2x \rightarrow \frac{b}{a} = -2$$

$$P = (\frac{1}{2}, y) \rightarrow y = ? \text{ است؟ } \cos \rightarrow P = (\frac{1}{2}, \frac{\sqrt{3}}{2})$$

$$\rightarrow \gamma_0 - 2\gamma_0 = -100 \rightarrow -100 + 2\gamma_0 = +100 \Rightarrow \gamma_0 = 100$$

$$\alpha = \gamma_0 + \gamma_0 + \gamma_0 = 100^\circ, B = 110^\circ - 100^\circ = 10^\circ$$

$$\sin \alpha = 1 - \cos 2\alpha \rightarrow \sin 10^\circ = 1 - \frac{\sqrt{3}}{2}$$

$$\rightarrow \sin 10^\circ = \frac{2 - \sqrt{3}}{2}$$

$$\frac{a}{\sin 10} = \frac{b}{\sin 10} = \frac{c}{\sin 100} \rightarrow \frac{1}{\frac{2 - \sqrt{3}}{2}} = \frac{c}{\frac{1}{2}}$$

$$c = \sqrt{1 + \sqrt{3}} \rightarrow P = \gamma + \sqrt{1 + \sqrt{3}}$$

Senobar

1, 10

$$\frac{H}{A} = \frac{r_0}{110} \rightarrow \alpha = 20^\circ \rightarrow \text{بین مرکزی } 60^\circ \text{ ماکت}$$

$$\text{تعداد } \omega = 40 \text{ min} = 12 \text{ ساعت } 20^\circ \rightarrow 12 \text{ ساعت } \times 2 = \text{min}$$

$$\Rightarrow r_0 \times r = 80 \text{ min} \rightarrow r + 80 \text{ min} = \boxed{r = 20} \rightarrow ?$$

$$\alpha = \left| \frac{1}{r} M - r_0 H \right| \Rightarrow \begin{cases} \omega / \omega M - 90 = 20 \rightarrow \frac{1}{r} M = 110 \\ \omega / \omega M - 90 = -20 \rightarrow \frac{1}{r} M = 70 \end{cases}$$

$$\rightarrow \begin{cases} M = 20 \\ M = \frac{120}{11} \end{cases} \Rightarrow r_0 > \frac{120}{11} \rightarrow \begin{cases} 20 \text{ min} \rightarrow \text{ب} \\ \frac{120}{11} \text{ min} \rightarrow \text{ا، ب} \end{cases}$$

$$-\frac{H}{r} < \alpha \leq \frac{\omega H}{r} \rightarrow \text{Diagram} \rightarrow -\frac{1}{r} < \sin \alpha \leq 1$$

$$\sin = \frac{M-r}{a} \rightarrow -\frac{1}{r} < \frac{M-r}{a} \leq 1 \xrightarrow{\omega} -\frac{a}{r} < M-r \leq a \xrightarrow{+r}$$

$$\boxed{\frac{1}{r} < M \leq 1} \rightarrow ?$$

$$\frac{\sin(10^\circ) + K \cos(70^\circ)}{\cos(70^\circ) + r \sin(10^\circ)} = r \xrightarrow{\alpha=10^\circ} \frac{\sin(\frac{H}{r} + \alpha) + K \cos(\frac{H}{r} - \alpha)}{\cos(H - \alpha) + r \sin(H + \alpha)}$$

$$\frac{+ \cos \alpha - K \sin \alpha}{- \cos \alpha - r \sin \alpha} = r \xrightarrow{\div \cos \alpha} \frac{1 - K \tan \alpha}{-1 - r \tan \alpha} = r$$

$$\xrightarrow{\tan \alpha = x} \frac{1 - \frac{K}{r}}{-1 - \frac{1}{r}} = r \rightarrow 1 - \frac{K}{r} = r \times \frac{-r}{1} = -\frac{r}{1}$$

$$-\frac{K}{r} = -\frac{1}{r} \rightarrow \boxed{K = 1 + rr} \rightarrow ?$$

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SUBJECT

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$$\frac{Y \cot \alpha}{- \tan \alpha} = -Y \cot \alpha = -\frac{1}{k}$$

$$\frac{\tan(\frac{\pi}{2} - \alpha) - \cot(\mu - \alpha)}{\cot(\frac{\pi}{2} - \alpha) - Y \tan(\mu - \alpha)} = \frac{+ \cot \alpha + \cot \alpha}{+ \tan \mu + Y \tan \mu} = \frac{Y \cot \alpha}{Y \tan \alpha}$$

$$\frac{1 - \cos \alpha}{1 + \cos \alpha} = Y \rightarrow 1 - \cos \alpha = Y + Y \cos \alpha \rightarrow 1 = Y \cos \alpha \rightarrow \cos \alpha = \frac{1}{Y}$$

$$\cos \alpha < 0, \sin \alpha > 0, \tan \alpha < 0, \cot \alpha < 0$$

$$\tan \alpha = -\frac{1}{\sqrt{14}}, \cot \alpha = -\sqrt{14}$$

$$\frac{Y \cot \alpha}{-Y \tan \alpha} = \frac{+Y \sqrt{14}}{\frac{Y}{\sqrt{14}}} = \frac{+Y \times 14}{Y} = 14$$

$$\frac{10 \text{ A}}{1 \text{ A}} = \frac{Y \times 14}{14} \rightarrow \alpha_A R_A = \alpha_B R_B$$

$$\frac{Y \times 14}{14} \times R_A = \frac{14}{14} \times R_B \rightarrow \frac{R_A}{R_B} = \frac{Y}{1}$$

$$\frac{S_A}{S_B} = \left(\frac{R_A}{R_B}\right)^2 \times \frac{\alpha_A}{\alpha_B} = \frac{9}{2}$$

$$AD = 1 \times Y = Y \rightarrow AB = Y \times \sqrt{14} = \sqrt{14}$$

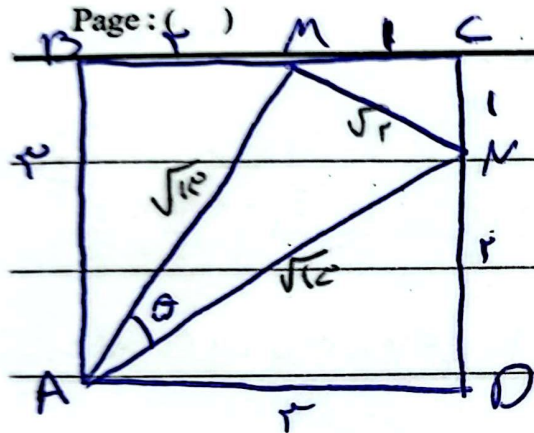
$$S_{ABE} = \sqrt{14} \rightarrow \frac{1}{2} \times AB \times BC = \sqrt{14} \rightarrow \frac{1}{2} \times \sqrt{14} \times BC = \sqrt{14}$$

$$BC = 2 \rightarrow DC = 1, AC = \sqrt{14 + 2} = \sqrt{16}$$

$$\sin C = \frac{\sqrt{2}}{\sqrt{16}}, \cos C = \frac{Y}{\sqrt{16}}$$

$$\sin Y = Y \sin C \cos C = Y \times \frac{\sqrt{2}}{\sqrt{16}} \times \frac{Y}{\sqrt{16}} = \frac{Y^2 \sqrt{2}}{16}$$





$$MN = \sqrt{1+1} = \sqrt{2}$$

$$AM = \sqrt{3+9} = \sqrt{12}$$

$$AN = \sqrt{3+9} = \sqrt{12}$$

$$S_{ABM} = \frac{1}{2} \times 4 \times 1 = 2, S_{ADN} = \frac{1}{2} \times 3 \times 1 = \frac{3}{2}, S_{MNC} = \frac{1}{2} \times 1 \times 1 = \frac{1}{2}$$

$$S_{AMN} = 9 - (2 + \frac{3}{2} + \frac{1}{2}) = 9 - 4 = 5$$

$$S_{AMN} = \frac{1}{2} \times \sqrt{10} \times \sqrt{12} \times \sin \theta = 5 \rightarrow \sin \theta = \frac{5}{\sqrt{30}} = \frac{\sqrt{30}}{6}$$