

$$\frac{a \sin \frac{\pi}{4} + b \cos \frac{\pi}{4}}{-\frac{\sqrt{2}}{2}} = \tan \frac{\pi}{4} \rightarrow \frac{-\frac{\sqrt{2}}{2} a - \frac{\sqrt{2}}{2} b}{-\frac{1}{2} a + \frac{1}{2} b} = \frac{-\sqrt{2}(a+b)}{\frac{1}{2}(b-a)} = \sqrt{2}$$

$$\frac{a+b}{b-a} = \frac{1}{\sqrt{2}} \rightarrow \sqrt{2}a + \sqrt{2}b = b - a \rightarrow b = -\sqrt{2}a \quad \frac{b}{a} = -\sqrt{2}$$



$P(\frac{1}{r}, y) \xrightarrow{\text{دایره}} \theta = 45^\circ \xrightarrow{\sin \theta = \frac{y}{r}} y = \frac{\sqrt{2}}{r}$

$opp' \text{ به } r = r + pp' \xrightarrow{r=1} r + pp'$

$pp' = \sqrt{op'^2 - r^2} = \sqrt{(op')^2 - r^2} \xrightarrow{\text{دایره}} \sqrt{r + r}$

$\xrightarrow{\text{دایره}} r + \sqrt{r + r}$ ✓



$\frac{Rad}{\pi} = \frac{D}{180} \rightarrow \frac{\pi}{180} = \frac{D}{180} \rightarrow D = \pi$

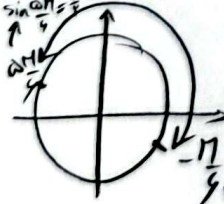
$\frac{r}{180} \mid h \rightarrow \frac{r}{180} h \rightarrow \epsilon_{min}$

$r_{min} + \epsilon_{min} \rightarrow r_{min}$ ✓

$\alpha = |a, am - r_0 h| \rightarrow r_0 = |a, am - 90|$

$a, am - 90 \rightarrow +r \rightarrow m = r_{min}$ ✓

$\rightarrow -r \rightarrow m = \frac{r_0}{a} = \frac{180}{11}$ ✓



$-\frac{\pi}{4} < n \leq \frac{\pi}{4} \quad \sin n = \frac{m-r}{a}$

$-\frac{1}{2} < \sin n \leq 1 \rightarrow -\frac{1}{2} < \frac{m-r}{a} \leq 1$

$\xrightarrow{\times a} -\frac{a}{2} < m-r \leq a \xrightarrow{+r} \frac{r-a}{2} < m \leq a+r$

$(\frac{r-a}{2}, \frac{r-a}{2}, \frac{r-a}{2}, \frac{r-a}{2}, \frac{r-a}{2}, \frac{r-a}{2})$ ✓

$$\sin\left(\frac{\pi}{4} + \alpha\right) + k \cos\left(\frac{\pi}{4} - \alpha\right) \quad \alpha = 15^\circ$$

$$\frac{\cos \alpha - k \sin \alpha}{\cos(\pi - \alpha) + r \sin(\alpha + \pi)} = \frac{\cos \alpha - k \sin \alpha}{-\cos \alpha - r \sin \alpha} = r$$

$$1 - k \tan \alpha = -r \tan \alpha - r \rightarrow 1 - \frac{k}{2} = -\frac{r}{2} - \frac{r}{2} \rightarrow \frac{k}{2} = \frac{1}{2}$$

$$\{k = 1\} \checkmark$$

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$$\frac{1 - \cos n}{1 + \cos n} = r \rightarrow 1 - \cos n = r + r \cos n \rightarrow r \cos n = -1$$

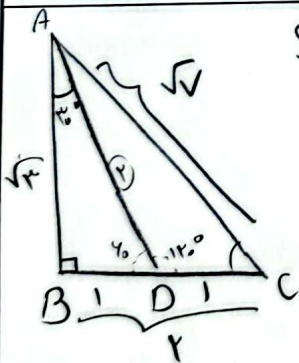
$$\cos n = \frac{-1}{r}$$

$$\sin n = \sqrt{1 - \cos^2 n} \rightarrow \sqrt{1 - \frac{1}{r^2}} \rightarrow \frac{\sqrt{r^2 - 1}}{r} \rightarrow \tan n = -\sqrt{n}$$

$$\frac{\tan\left(\frac{\pi}{4} - n\right) - c \cdot t(n - n)}{c \cdot t\left(\frac{\pi}{4} - n\right) + \tan(n - n)} = \frac{c \cdot t n + c \cdot t n}{\tan n - r \tan n} \rightarrow \frac{r \cos n}{\sin n} = \frac{-\sqrt{n}}{1} \rightarrow \frac{-r \cos n}{\sin n} = -\frac{1}{r} \rightarrow \frac{1}{r} = \frac{1}{r}$$

$$1 \cdot \frac{\pi}{4} \times \frac{\pi}{4} = \frac{\pi^2}{16}$$

$$\frac{S_A}{S_B} = \left(\frac{R_A}{R_B}\right)^2 \rightarrow \left(\frac{r}{1}\right)^2 \rightarrow \frac{r^2}{1} = \frac{r^2}{1}$$



$$S_{ABC} = \sqrt{2} \rightarrow \frac{AB \times BC}{2} = \sqrt{2} \rightarrow \sqrt{2} \times BC = 2\sqrt{2} \rightarrow BC = 2$$

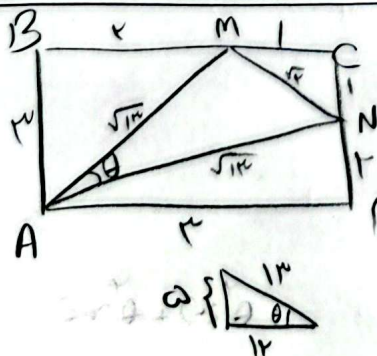
$$AD = \frac{BD}{\sin 45^\circ} \rightarrow \frac{1}{\frac{1}{\sqrt{2}}} = \sqrt{2}$$

$$AB^2 + 1 = 2 \rightarrow AB = 1$$

$$(BD)^2 + (AB)^2 = (AC)^2 = 1 + 1 = 2 \rightarrow AC = \sqrt{2}$$

$$\sin \hat{C} = \frac{r \sin \hat{C} \cos \hat{C}}{r \times \frac{1}{\sqrt{2}} \times \frac{1}{\sqrt{2}}} \Rightarrow \frac{\sqrt{2}}{2}$$

$$S_{ABD} = S_{ADC} \rightarrow \frac{1 \times \sqrt{2}}{2} = \frac{1}{2} \times 1 \times \sqrt{2} \times \sin \hat{C} \rightarrow \sin \hat{C} = \frac{\sqrt{2}}{2}$$



$$\sin \theta = \frac{1}{2} \rightarrow \theta = 30^\circ$$

$$MN = \sqrt{2}, AM = AN = \sqrt{2}$$

$$(MN)^2 = (AM)^2 + (AN)^2 - 2(AM)(AN) \cos \theta$$

$$2 = 2 + 2 - 2 \times 2 \cos \theta \rightarrow 2 \cos \theta = 1 \rightarrow \cos \theta = \frac{1}{2} \rightarrow \theta = 60^\circ$$