

$$\frac{a \sin \frac{\pi}{4} + b \cos \frac{\pi}{4}}{a \sin \frac{3\pi}{4} + b \cos \frac{\pi}{4}} = \tan \frac{\pi}{4} \quad (1)$$

$$\rightarrow \frac{-a \sin \frac{\pi}{4} - b \cos \frac{\pi}{4}}{-a \sin \frac{\pi}{4} + b \cos \frac{\pi}{4}} = -\tan \frac{\pi}{4}$$

$$\frac{-a\sqrt{2}}{2} - \frac{b\sqrt{2}}{2} = -\frac{\sqrt{2}}{2} \rightarrow \frac{-\sqrt{2}}{2}(a+b) = -\frac{\sqrt{2}}{2}(-a+b)$$

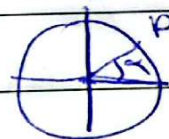
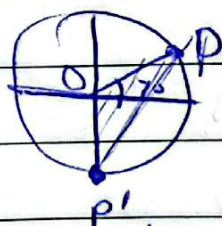
$$\frac{-a}{2} + \frac{b}{2}$$

$$\rightarrow 3a + 3b = -a + b \rightarrow 4a = -2b \rightarrow b = -2a$$

$$\frac{b}{a} = \frac{-2a}{a} = -2$$

$$\cos \alpha = \frac{1}{2} \rightarrow \alpha = 60^\circ$$

$$90^\circ + 2 \times 60^\circ = 180^\circ$$



$$PP' = OP + OP' - 2(OP)(OP') \cos \hat{O} \rightarrow PP' = 1 + 1 - 2 \cos 180^\circ$$

$$= 2 + 2 \cos 180^\circ = 2$$

$$PP = 1 + 1 + 2 = 4$$

عقبی حالت مقدار $\frac{\pi}{2}$ می شود $\rightarrow$ هر حالت

(۳)

$$\frac{\pi}{9} = \frac{\pi}{6} \times \left(\frac{2}{3}\right)$$

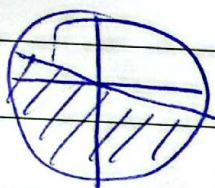
$$\frac{2}{3} \times 90 = 60 \quad \text{درجه}$$

$$\boxed{P: 60}$$

$$\alpha = \frac{11M}{2} \quad |P_H| = P_0 \rightarrow \frac{11M}{2} - 90 = P_0 \rightarrow \frac{11M}{2} = 110 \rightarrow m = 20 \quad \checkmark$$

$$\rightarrow \frac{11M}{2} + 90 = P_0 \rightarrow \frac{11M}{2} = 70 \rightarrow m = \frac{140}{11}$$

در 20° زاویه $\boxed{P_0 > P_0}$ ~~در 70° زاویه $\boxed{P_0 < P_0}$~~



$$-1 \leq \sin x \leq \frac{1}{2}$$

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$$-1 \leq \frac{m-2}{2} \leq \frac{1}{2} \rightarrow -2 \leq m \leq \frac{11}{2}$$

$$\{-2, -1, 0, 1, 2, 3, 4\} \rightarrow \text{مجموعه } A$$

$$\frac{\sin 10^\circ + k \cos(40^\circ)}{\cos 10^\circ + k \sin 10^\circ} = 2 \quad \tan 10^\circ = 0.176 \quad (5)$$

$$\rightarrow \frac{\cos 10^\circ + k \sin 10^\circ}{-\cos 10^\circ - k \sin 10^\circ} = 2 \div \frac{\cos 10^\circ}{-1} \frac{1 - k(0.176)}{-1 - 2(0.176)} = 2$$

$$1 - \frac{k}{2} = -1.35 \rightarrow \frac{k}{2} = 2.35 \rightarrow k = \boxed{4.7}$$



$$1 - \cos n = r + r \cos n$$

(v)

$$r \cos n = -1 \rightarrow \cos n = -\frac{1}{r} \quad \tan = r\sqrt{r}$$

$$\sin^2 n = 1 - \frac{1}{r} = \frac{r-1}{r} \rightarrow \sin n = \frac{\sqrt{r-1}}{\sqrt{r}} \quad \cot n = \frac{-1}{r\sqrt{r}} = -\frac{1}{r\sqrt{r}}$$

$$\frac{\tan(\frac{\pi}{r} - n) - \cot(\pi - n)}{\cot(\frac{\pi}{r} - n) + r \tan(\pi - n)} = \frac{\cot n + \cot n}{\tan n - r \tan n} = \frac{r \cot n}{- \tan n}$$

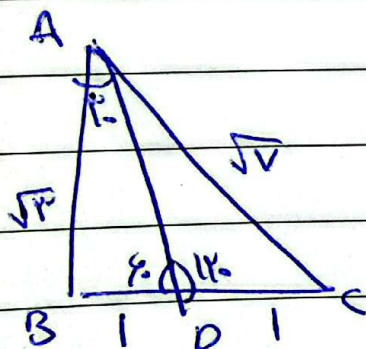
$$= \frac{-\sqrt{r}}{r} = \left(-\frac{1}{r} \right)$$

$$10 \times \frac{\pi}{210} = \frac{r\pi}{a} = \frac{r\pi}{10}$$

(A)

$$\frac{r\pi}{10} r_A = \frac{r\pi}{10} r_B \rightarrow \frac{r_B}{r_A} = \frac{r}{r} = \frac{r}{r}$$

$$\frac{S_A}{S_B} = \left(\frac{r_A}{r_B} \right)^2 = \left(\frac{r}{r} \right)$$



$$S = \frac{AB \times BC}{r} = \sqrt{r}$$

$$\sqrt{r} \times \frac{BC}{r} = \sqrt{r} \rightarrow BC = r$$

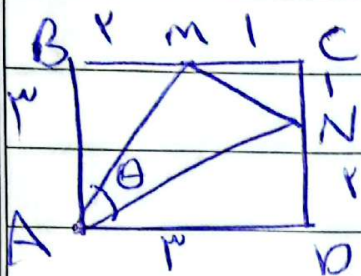
$$DC = 1$$

$$AC = \sqrt{r+1} = \sqrt{r}$$

$$\sin \hat{C} = r \sin \hat{C} \cdot \cos \hat{C} =$$

$$\frac{r\sqrt{r}}{\sqrt{r}} \times \frac{r}{\sqrt{r}} = \left(\frac{r\sqrt{r}}{r} \right)$$

(4)



$$AN = \sqrt{1+9} = \sqrt{10}$$

(1)

$$AM = \sqrt{1+9} = \sqrt{10}$$

$$S_{ABCD} = 4 \times 1 = 4$$

$$S_{AMN} = 4 - \frac{(4 \times 1)}{2} - \frac{(4 \times 1)}{2} - \frac{(1 \times 1)}{2} =$$

$$4 - 2 - 2 - \frac{1}{2} = \frac{3}{2}$$

$$\frac{AM \times AN \times \sin \theta}{2} = \frac{3}{2} \rightarrow \sqrt{10} \times \sqrt{10} \times \sin \theta = 3 \rightarrow \sin \theta = \frac{3}{10}$$