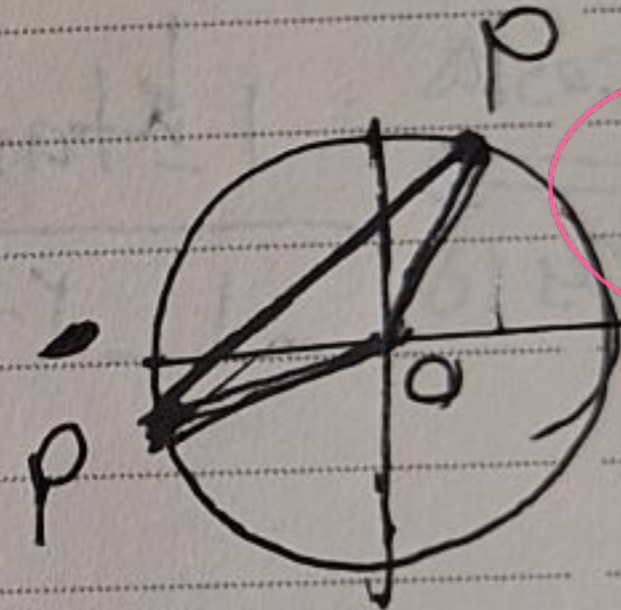
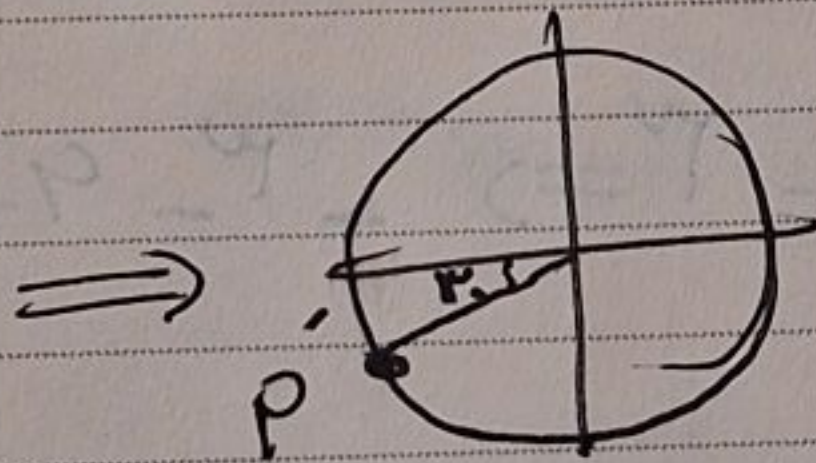
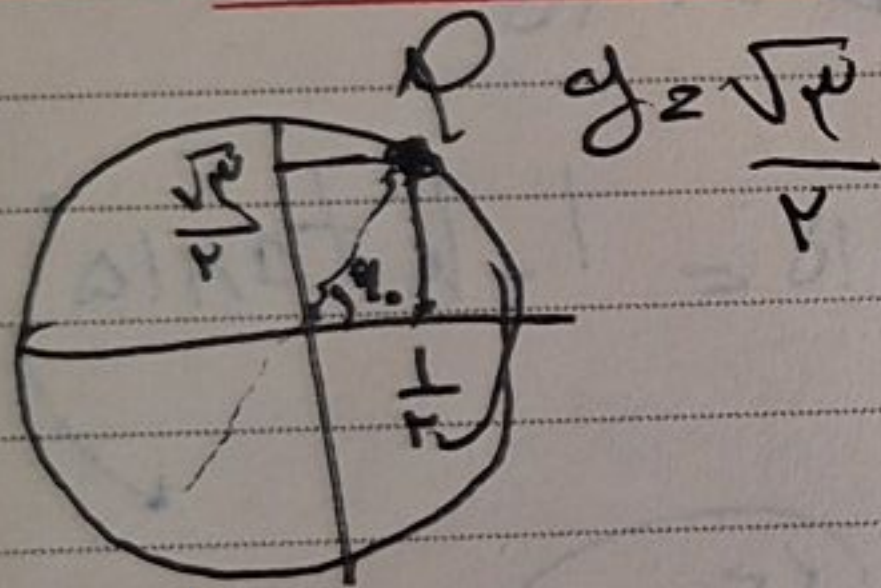


$$\frac{a \sin \frac{\pi}{3} + b \cos \frac{\pi}{4}}{a \sin \frac{\pi}{4} + b \cos \frac{\pi}{3}} = \tan \omega$$

$$\Rightarrow \frac{-\frac{\sqrt{3}}{2}a - \frac{\sqrt{3}}{2}b}{\frac{1}{2}a + \frac{1}{2}b} = -\frac{\sqrt{3}}{2} \Rightarrow \frac{\sqrt{3}(a+b)}{\frac{1}{2}(a-b)} = \frac{\sqrt{3}}{2}$$

$$\Rightarrow \frac{-(a+b)}{a-b} = \frac{1}{2} \Rightarrow -2a - 2b = a - b \Rightarrow 3a = -2b$$

$$\frac{b}{a} = -\frac{3}{2}$$



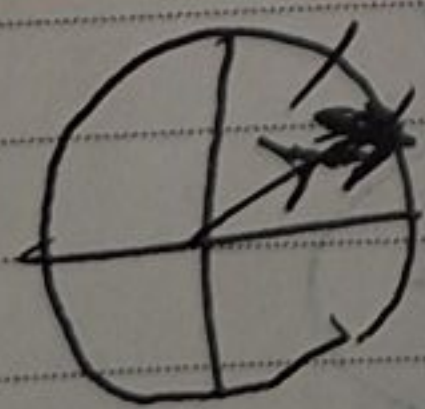
OP = OP'
شعاع دایره متحدتی = ۱

$$OP = \sqrt{\left(\frac{1}{2}\right)^2 + \left(\frac{\sqrt{3}}{2}\right)^2} = \frac{\sqrt{4}}{2}$$

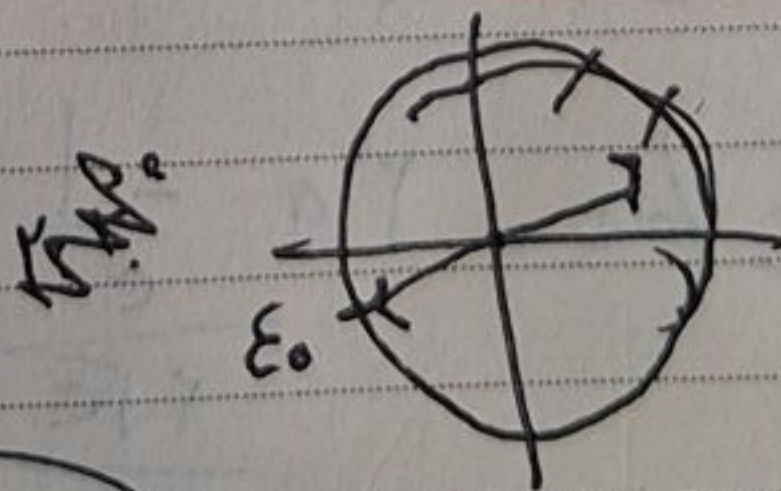
$$OP = \sqrt{\left(-\frac{1}{2}\right)^2 + \left(\frac{\sqrt{3}}{2}\right)^2} = \frac{\sqrt{4}}{2}$$

$$PP' = \sqrt{\left(\frac{1}{2} - \left(-\frac{1}{2}\right)\right)^2 + \left(\frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2}\right)^2} = \sqrt{\left(\frac{1+\sqrt{3}}{2}\right)^2 + \left(\frac{\sqrt{3}-1}{2}\right)^2} = \sqrt{2+\sqrt{3}}$$

$$\Rightarrow k = \sqrt{2+\sqrt{3}}$$

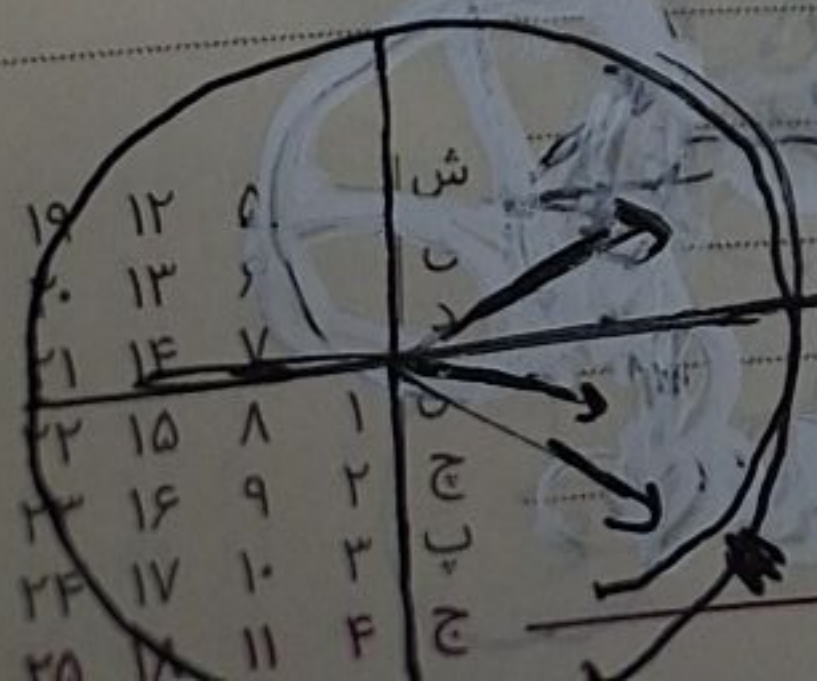


$$\frac{\pi}{6} \times \frac{18}{\pi} = 30^\circ$$



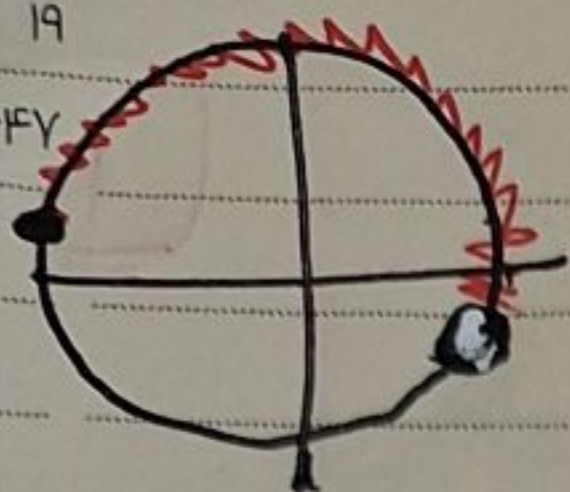
عقربه ساعت
شمار

$$\frac{30^\circ}{2} = 15^\circ$$



$$\frac{15^\circ}{2} = 7.5^\circ$$

در ساعت ۲:۲۰
کلیه قاصدین عقربه
ساعت و دقیقه هماهنگ



$$\Rightarrow -1 \leq \sin \alpha \leq 1 \Rightarrow -1 \leq \frac{m-r}{r} \leq 1$$

5

2

$$\begin{aligned} \frac{m-r}{r} \leq 0 &\Rightarrow m-r \leq 0 \Rightarrow m \leq r \\ \frac{m-r}{r} > 0 &\Rightarrow m-r > 0 \Rightarrow m > r \end{aligned}$$

$$\frac{1}{c} \leq m \leq 1$$

4

$$\frac{\sin(105^\circ) + k \cos(105^\circ)}{\cos(105^\circ) + r \sin(105^\circ)} = \frac{\cos 10^\circ - \sin 10^\circ}{-\cos 10^\circ + r \sin 10^\circ} = r$$

$$\frac{\cos 10^\circ}{\cos 10^\circ} \frac{1 + k \tan 10^\circ}{-1 + r \tan 10^\circ} = r \Rightarrow r - r \tan 10^\circ = 1 - k \tan 10^\circ$$

$$\frac{k}{r} = \frac{1}{\tan 10^\circ} \Rightarrow k = 1.44 \approx 1.5$$

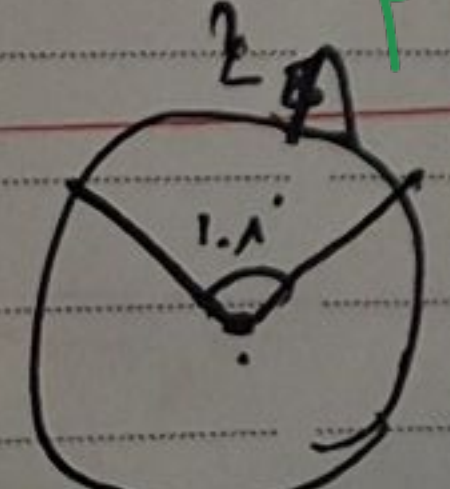
$$-r \cot \alpha \times \cot \alpha = -r \cot^2 \alpha$$

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

1/5

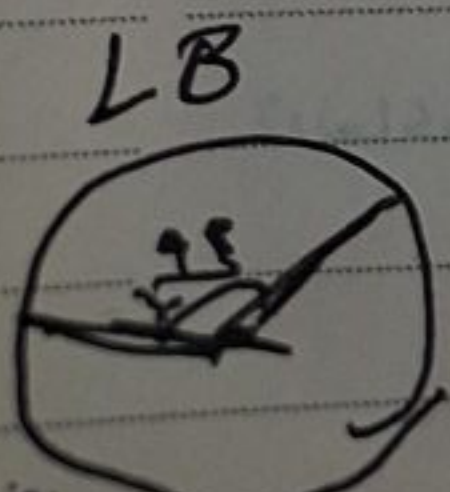
$$r + r \cos \alpha, 1 - \cos \alpha \Rightarrow \cos \alpha = -1 \Rightarrow \alpha = \pi \Rightarrow \sin \alpha = \frac{r\sqrt{2}}{r}$$

$$\cot \alpha = \frac{-1}{\frac{r\sqrt{2}}{r}} = \frac{-1}{\sqrt{2}} \Rightarrow \frac{r\sqrt{2}}{r} = \frac{-1}{\sqrt{2}} \Rightarrow \frac{r\sqrt{2}}{r} = \frac{-1}{\sqrt{2}} \Rightarrow \frac{r\sqrt{2}}{r} = \frac{-1}{\sqrt{2}}$$



$$L_B = \frac{1.1 \pi}{1.1} r_A = \frac{1}{1} \pi r_A$$

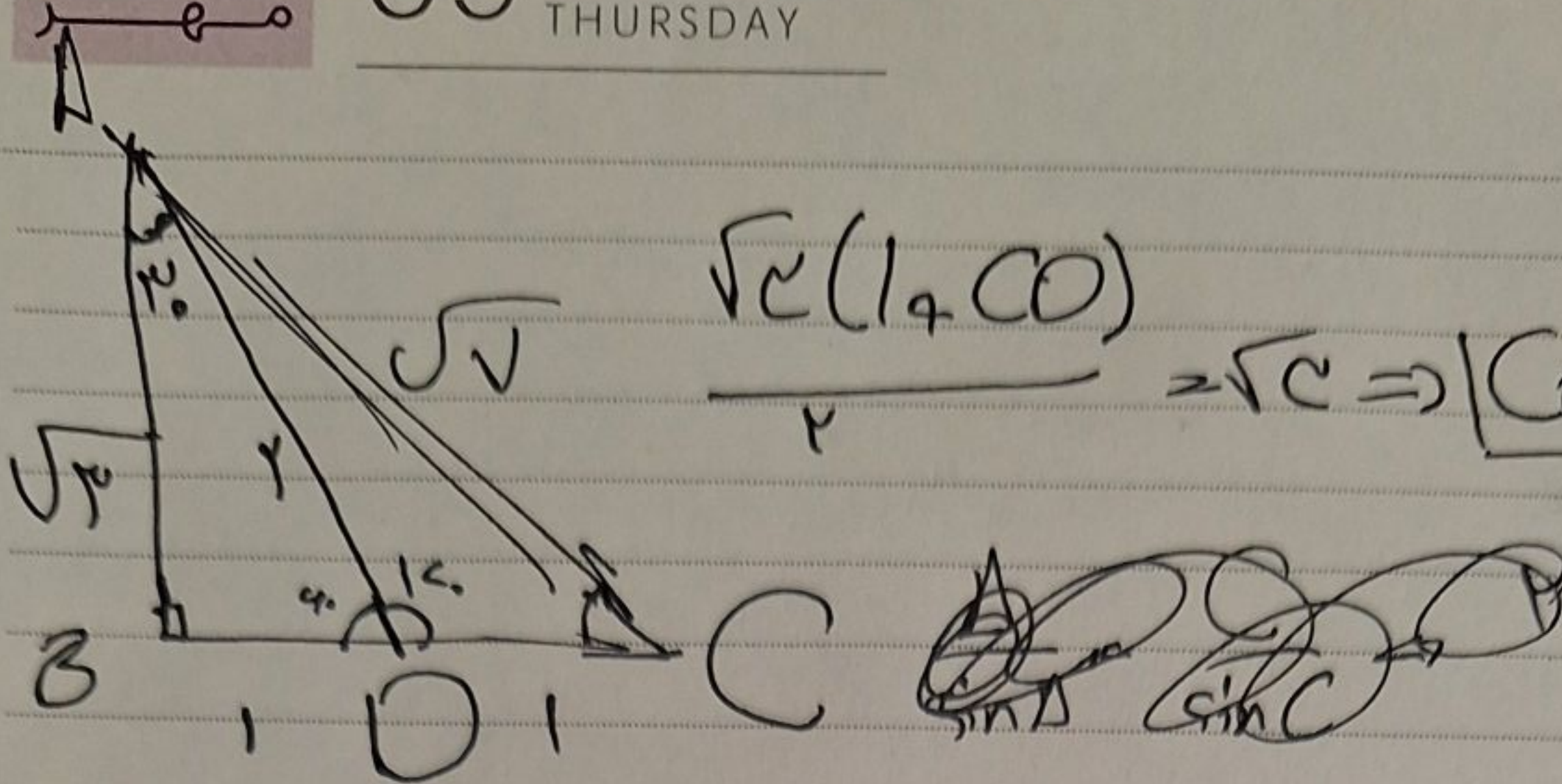
$$\frac{r_B}{r_D} = \frac{r}{c} \Rightarrow \frac{r_B}{r_D} = \frac{r}{c} \Rightarrow \frac{r_B}{r_D} = \frac{r}{c}$$



$$L_B = \frac{9.8}{r_0} r_B$$

$$\frac{r_B}{r_D} = \frac{r}{c} \Rightarrow \frac{r_B}{r_D} = \frac{r}{c} \Rightarrow \frac{r_B}{r_D} = \frac{r}{c}$$

M	6	13	20	27
T	7	14	21	28
W	1	8	15	22
T	2	9	16	23
F	3	10	17	24
S	4	11	18	25
S	5	12	19	26



$$\frac{\sqrt{2}(14 \cos C)}{2} = \sqrt{2} \Rightarrow \cos C = 1$$

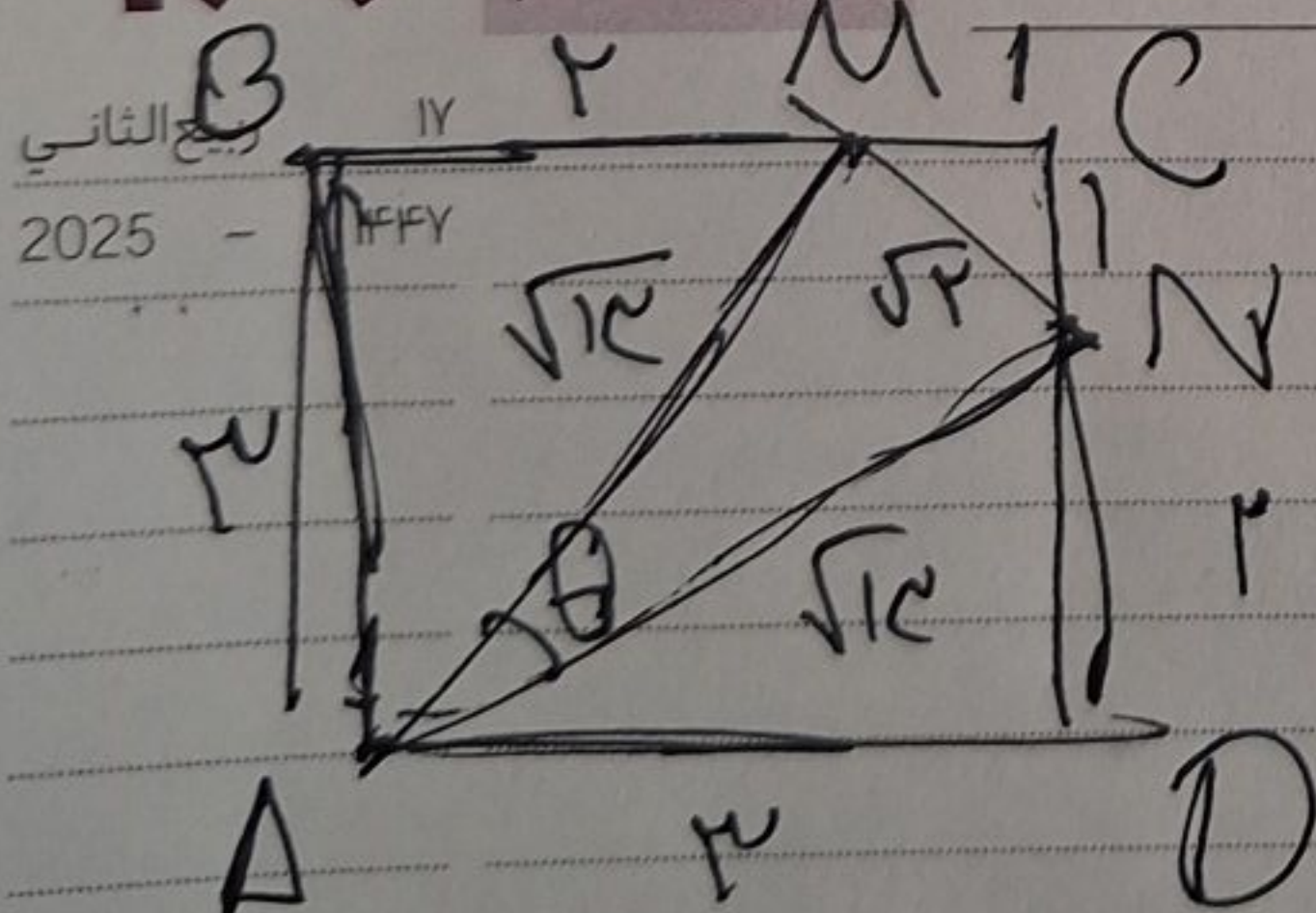
9

$$AC = \sqrt{14} \Rightarrow \frac{AC}{\sin D} = \frac{AD}{\sin C} \Rightarrow \frac{\sqrt{14}}{\frac{\sqrt{3}}{2}} = \frac{2}{\sin C}$$

$$\sin C = \frac{\sqrt{2}}{\sqrt{14}} \text{ و } \cos C = \frac{1}{\sqrt{14}}$$

$$\Rightarrow \sin 120 = 2 \sin C \cos C = \frac{2 \sqrt{2} \times 1}{\sqrt{14} \times \sqrt{14}} = \frac{2 \sqrt{2}}{14}$$

10



$$MN^2 = DM^2 + AN^2 - 2DM \cdot MN \cos \theta$$

$$4 = (13 + 17) - 2 \times 4 \cos \theta \Rightarrow 4 \cos \theta = 15$$

$$\cos \theta = \frac{15}{12} \Rightarrow \sin \theta = \frac{5}{12}$$

M	6	13	20	27
T	7	14	21	28
W	1	8	15	22
T	2	9	16	23
F	3	10	17	24
S	4	11	18	25
S	5	12	19	26