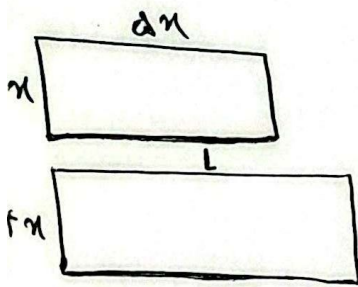


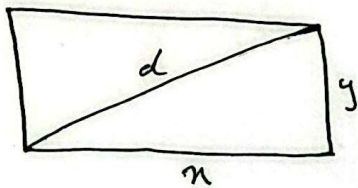
۱۵, ۵

$$A_1 = \omega n \times r n = r \omega n^2$$



$$\frac{L}{r n} = \frac{1 + \sqrt{a}}{r} \rightarrow L = r n (1 + \sqrt{a}) \rightarrow L = r n (1 + \sqrt{a})$$

$$\frac{A_r}{A_1} = \frac{r n^2 (1 + \sqrt{a})}{r \omega n^2} = \frac{r n^2 (1 + \sqrt{a})}{r \omega n^2} \checkmark$$



$$d = \sqrt{n^2 + y^2}$$

$$\frac{d}{n} = \frac{1 + \sqrt{a}}{r}$$

$$\left(\frac{\sqrt{n^2 + y^2}}{n} \right)^2 = \left(\frac{1 + \sqrt{a}}{r} \right)^2 \rightarrow \frac{n^2 + y^2}{n^2} = \frac{(1 + \sqrt{a})^2}{r^2} \rightarrow 1 + \frac{y^2}{n^2} = \frac{(1 + \sqrt{a})^2}{r^2}$$

$$(1 + \sqrt{a})^2 = 1 + 2\sqrt{a} + a = 4 + 2\sqrt{a} \rightarrow \frac{y^2}{n^2} = \frac{4 + 2\sqrt{a}}{r^2} - 1 = \frac{2 + 2\sqrt{a}}{r^2} = \frac{1 + \sqrt{a}}{r}$$

$$\frac{y}{n} = \sqrt{\frac{1 + \sqrt{a}}{r}} \rightarrow \frac{n}{y} = \sqrt{\frac{r}{1 + \sqrt{a}}} \checkmark$$

$$r a + \sqrt{r a^2 + a} = r \rightarrow -r a + r = \sqrt{r a^2 + a} \xrightarrow{\text{توان دوم}} r a^2 + a = 9 a^2 + r - 12 a$$

$$r a^2 - 14 a + r = 0$$

$$\frac{a+1}{a} \rightarrow \frac{\frac{r}{v} + \frac{v}{r}}{\frac{r}{v}} = \frac{\frac{r}{v}}{\frac{r}{v}} = \frac{r \times v}{r \times v} = \left(\frac{r}{v} \right) \checkmark$$

$$a^2 - 14 a + r = 0 \rightarrow (a-2)(a-12) = 0 \rightarrow a = \left(\frac{14}{v} \right) \times$$

$$a = \left(\frac{r}{v} \right) \checkmark$$

$$\sqrt{m-1} = t \quad \frac{\sqrt{t^2 + r}}{t+r} - \frac{\sqrt{t^2 + 1}}{r-t} = \frac{t^2}{t} = t$$

$$\sqrt{t^2 + r} \left(\frac{1}{t+r} - \frac{1}{r-t} \right) = t \rightarrow \frac{-2t \sqrt{t^2 + r}}{9 - t^2} = t \quad t > 0$$

$$\frac{-2t \sqrt{t^2 + r}}{9 - t^2} = 1 \rightarrow -2t \sqrt{t^2 + r} = 9 - t^2 \rightarrow 9 - t^2 < 0 \Rightarrow t > 3$$

$$11 - 4\sqrt{3} < 9 \times$$

$$11 + 4\sqrt{3} > 9 \checkmark$$

$$t^2 \geq 11 + 4\sqrt{3} \rightarrow m-1 = 11 + 4\sqrt{3}$$

$$n = 12 + 4\sqrt{3} \checkmark$$

$$t^2 + 1 = t^2 - 12t^2 + 11$$

$$t^2 - 12t^2 + 11 = 0$$

$$y = t^2$$

$$y^2 - 12y + 11 = 0 \rightarrow y = \frac{12 \pm \sqrt{12^2 - 4 \times 11}}{2} = 11 \pm \sqrt{5}$$

$$\sqrt{r-n} = t$$

$$\frac{1}{t+r} - \frac{1}{r-t} = \frac{t^r}{at}$$

-5

$$\frac{r-t-t-r}{(r+t)(r-t)} = \frac{t^r}{at} \rightarrow \frac{-2t}{r^2-t^2} = \frac{t^r}{at}$$

$$t^r (r-t^2) = -10t^r \rightarrow r-t^2 = -10$$

$$1r = t^2$$

$$\pm \sqrt{1r} = t$$

$$\sqrt{r-n} = \sqrt{1r} \checkmark \rightarrow n = -1r$$

$$\sqrt{r-n} = -\sqrt{1r} \times$$

در اینجا $n = -r$ را به دست می آوریم. در اینجا!

-9

$$\frac{1}{n^2} + \frac{1}{(1-n)^2} = \frac{190}{9} \quad n \neq 0, n \neq 1$$

$$\frac{(1-n)^2 + n^2}{n^2 (1-n)^2} = \frac{190}{9}$$

$$\frac{1-2n+2n^2}{n^2 (1-n)^2} = \frac{190}{9}$$

$$190n^2 - 380n^3 + 152n^4 + 18n - 9 = 0$$

$$\text{جمع ریشه ها} = \frac{380}{190} = 2 \quad n \neq 0, 1$$

-7

$$-n^2 + 2n - 1 \geq 0$$

$$\frac{-2 \pm \sqrt{4}}{-2} = 1, 1$$

$$\begin{array}{c|c} 1 & 1 \\ \hline - & - \end{array}$$

$$-n^2 + 2n^2 + 2an - 100 \geq 0 \Rightarrow -n^2 + 2n^2 + 2an \geq 100 \Rightarrow n(-n^2 + 2n + 2a) \geq 100$$

$$n = 5$$

$$\sqrt{5 + \sqrt{-(5)^2 + 2(5)^2 + 2a(5) - 100}} + \sqrt{(5)^2 + \sqrt{-(5)^2 + 2(5)^2 + 2a(5) - 100}} = 5 + 2 \checkmark$$

$$\sqrt{\frac{5}{2}} + \sqrt{\frac{5}{2}} = 5 \checkmark \quad n = 5 \text{ در اینجا!}$$

-10

بروز $\rightarrow n$
فرهاد $\rightarrow n+9$

$$\frac{1}{n} + \frac{1}{n+9} = \frac{1}{10}$$

$$\frac{n+9+n}{n(n+9)} = \frac{1}{10} \rightarrow \frac{2n+9}{n^2+9n} = \frac{1}{10}$$

$$n^2 + 9n = 20n + 180 \rightarrow n^2 - 11n - 180 = 0$$

$$(n-19)(n+9) = 0$$

$$n = -9 \times$$

$$n = 19 \checkmark$$

* بروز به تنهایی در ۳۶ ساعت!

$$|x+2| + |x-1| = \frac{|14-x|}{2}$$

1A

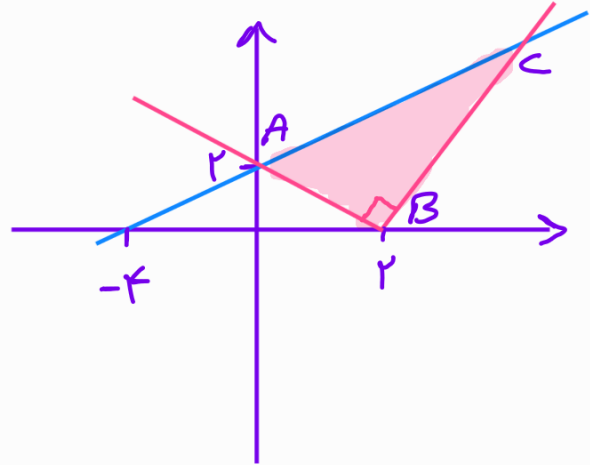
-2	1	
$x = -2$	$x = 1$	$x = 2$
$A(-2, 2)$	GGG	$B(2, 2)$

$$AB = \sqrt{4^2 + 2^2} = \boxed{2\sqrt{10}}$$

$$y = \sqrt{x^2 - 4x + 4} = |x-2|$$

$$x < 2 \rightarrow \frac{1}{2}x + 2 = x - 2$$

$$\rightarrow C(4, 4)$$



1A

$$AB = 2\sqrt{2} \quad BC = 4\sqrt{2} \rightarrow S = \frac{2\sqrt{2} \times 4\sqrt{2}}{2} = \boxed{12}$$