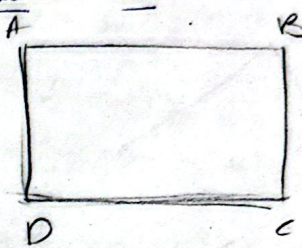


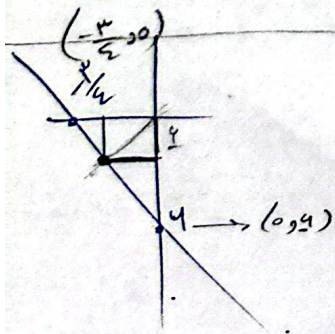
۱۔ نقطہ $A(-2, 4)$ و $B(4, m)$ ایک خط سبب $-\frac{1}{r}$ و نقطہ A اس محور مربع - مستقیم
 $\frac{1}{\text{خط}} = -\frac{1}{r} x + b \rightarrow \left(4, \frac{-2+b}{m}\right) \left(-2, \frac{1+b}{4}\right) \rightarrow \sqrt{(4+2)^2 + \left(\frac{b+1}{m} - \frac{b+2}{4}\right)^2} \rightarrow$
 $\sqrt{36+9} \rightarrow 3\sqrt{5} \rightarrow (3\sqrt{5})^2 = (45)$

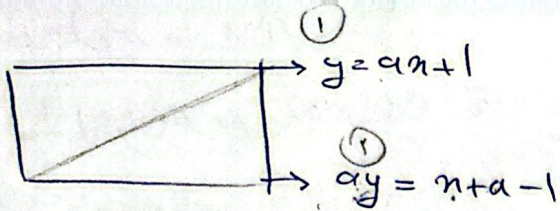
۲۔ نقطہ $A(-1, 4)$ و $B(3, 1)$ و $C(m, y)$ و $D(-1-n, y+3)$ ایک مستطیل
 $x_D + x_C = x_B + x_A \rightarrow -1+n = 3-1-n \rightarrow -1+n = 1-n \rightarrow n = \frac{3}{2}$
 $y_A + y_C = y_B + y_D \rightarrow 4+y = 1+3+y \rightarrow$ (نہیں ہوتا) 
 $AD \perp AB \rightarrow \frac{4-y-3}{n} \times \frac{3}{4} = -1$
 $1 - y \times \frac{3}{4n} = 1 \rightarrow 3-3y = 4 \left(\frac{3}{2}\right) \rightarrow 3-3y = 6 \rightarrow y = -1$
 $AB = \sqrt{9+16} = (5)$
 $BC = \sqrt{\left(3-\frac{3}{2}\right)^2 + (1-(-1))^2} = \sqrt{\left(\frac{3}{2}\right)^2 + 2^2} = \sqrt{\frac{9}{4} + 4} = \sqrt{\frac{25}{4}} = \frac{5}{2}$

۳۔ $rmn + (m^2-1)y = 3$ - $\frac{y}{m^2-1} = -\frac{rm}{m^2-1}$
 $-\frac{rm}{m^2-1} = \sqrt{3} \rightarrow \sqrt{3}m^2 - \sqrt{3} = -rm \rightarrow \sqrt{3}m^2 + rm - \sqrt{3} = 0$
 $\frac{b}{a} = \frac{-r}{\sqrt{3}} = \frac{\sqrt{14}}{\sqrt{3}} = \frac{r}{\sqrt{3}} = \frac{5\sqrt{3}}{3}$

$BC = \frac{11-3}{4-3} = 8 \rightarrow$ (۲) $\frac{y-rm+3}{\sqrt{5}} \rightarrow \frac{y-rm+3}{\sqrt{5}} = 8 \rightarrow y-rm+3 = 8\sqrt{5}$
 $ry = -8m+12$

۴۔ $B(3, 1)$ و $A(-1, 4)$ و $C(m, y)$ و $D(-1-n, y+3)$ ایک مستطیل
 $y + rm = 7, ry - vn = -19 \rightarrow vn - 19 = -8m + 12 \rightarrow 11m = 31 \rightarrow m = \frac{31}{11}$
 $\frac{4}{3} \rightarrow \frac{1}{3}x + 4$
 $4x + 4 = x \rightarrow x = \frac{4}{3} \rightarrow \sqrt{\frac{4}{3}}$



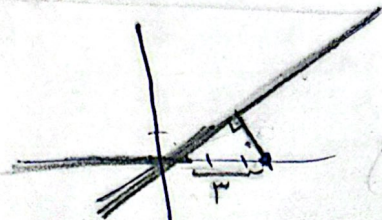
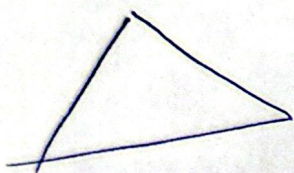


نقطه (1, 2) بر خط ① نمی‌باشد پس ② باشد
 $(2a = a \rightarrow \boxed{a = 1})$

$a = \frac{1}{a} \rightarrow \boxed{a = \pm 1} \rightarrow$ (1, 2) $\rightarrow (a = 1)$

$\left. \begin{matrix} y = x + 1 \\ y = x - 1 \end{matrix} \right\} \rightarrow \frac{1 - (-1)}{\sqrt{2}} = \frac{2}{\sqrt{2}} = \sqrt{2} \rightarrow \sqrt{2} \times \frac{1}{\sqrt{2}} = \boxed{1}$

مساحت $= \sqrt{2} \times \sqrt{2} = \boxed{2}$



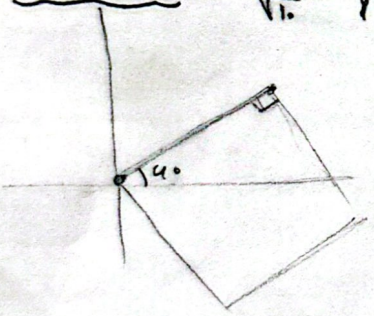
$F = 100 - 1 = \frac{99}{\sqrt{10}}$

$\rightarrow AC = AB = \frac{3}{\sqrt{10}}$ باشد مساحت $= \frac{1}{2} \times \frac{3}{\sqrt{10}} \times \frac{9}{\sqrt{10}} = \frac{27}{20}$

مساحت مستطیل AB و خط BC در نقطه $x = \frac{3}{10}$ است
 (I) $\sqrt{\frac{9}{10} + \frac{81}{100}} = \frac{3}{10}$ باشد

(I) & (II) $\Rightarrow S_{max} = \boxed{135}$

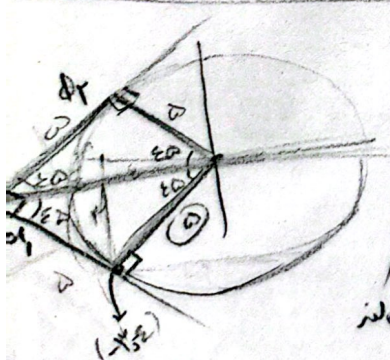
II) BC برابر $\frac{3}{\sqrt{10}}$ باشد $\Rightarrow$ چون BC را می‌توانیم صرفاً به‌جای $\frac{1}{\sqrt{10}}$ و $\frac{1}{\sqrt{10}}$ بگذاریم
 آن است و مساحت برابر است با $\frac{1}{10} \times \frac{3}{\sqrt{10}} \times \frac{1}{\sqrt{10}} = \frac{3}{100}$



$\left. \begin{matrix} -\frac{1}{4}\sqrt{3} + m = b \\ -\frac{1}{4}\sqrt{3} + m = a \end{matrix} \right\} \rightarrow \sqrt{\left(\frac{1}{4}\right)^2 + \left(\frac{1}{4}\sqrt{3}\right)^2}$

$\sqrt{\frac{1}{16} + \frac{3}{16}} \rightarrow \sqrt{\frac{4}{16}} = \frac{1}{2} = \boxed{\frac{1}{4}}$

$\boxed{\frac{1}{4} = \frac{\sqrt{3}}{4}}$



10- (ایستادن روی خط ②)
 $(-4, 3) \rightarrow (2, 4)$
 حاصله $(-5, -4)$ و $x^2 + y^2 = 25$
 $\sqrt{(5+4)^2 + (4+5)^2} = 5\sqrt{2}$
 $y = 3$ و $m = 4$ و $y = -\frac{5}{4}$
 باید از این معادله‌ها هم استفاده کرد
 نقطه برخورد به دست می‌آید

$\frac{5}{3}x \rightarrow -\frac{3}{5}x - \frac{15}{5}$

$\frac{5}{3}x + \frac{15}{3} = -\frac{3}{5}x - \frac{15}{5} \xrightarrow{\times 15} 14x + 100 = -9x - 15$
 $115 = -23x \rightarrow x = -5$
 $y = -1$
 $\boxed{xy = 5}$