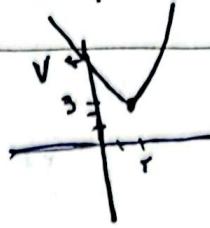


الف) $y_1 = x^2 - 4x + 7$
 $(x-2)^2 + 3$



ب) $y_2 = x^2 - 4x - 1$
 $\max_{x \in \mathbb{R}} = \frac{4}{2} = 2$



$2x^2 + (m+1)x + \frac{1}{2}m + 2 \geq 0$
 الف) $\Delta > 0 \Rightarrow (m+1)^2 - 4 \cdot 2 \cdot (\frac{1}{2}m + 2) > 0 \Rightarrow m^2 - 2m - 1 > 0 \Rightarrow m \in \mathbb{R} - [-1, 3]$
 ب) $\Delta = 0 \Rightarrow m^2 - 2m - 1 = 0 \Rightarrow m = 3 \text{ or } m = -1$
 ج) $\Delta < 0 \Rightarrow m^2 - 2m - 1 < 0 \Rightarrow m \in (-1, 3)$
 د) $\Delta \geq 0 \Rightarrow m^2 - 2m - 1 \geq 0 \Rightarrow m \in \mathbb{R} - (-1, 3)$

$y = (m-2)x^2 - 2(m+1)x + 1$
 الف) $S < 0 \rightarrow -\frac{b}{a} = \frac{2(m+1)}{m-2} < 0 \Rightarrow m \in (-1, 2)$
 $P > 0 \rightarrow \frac{c}{a} > 0 \rightarrow \frac{1}{m-2} > 0 \Rightarrow m \in (2, +\infty)$
 $\Delta > 0 \rightarrow 4(m+1)^2 - 4(m-2) > 0 \Rightarrow m > 2$
 ب) $P < 0 \rightarrow \frac{1}{m-2} < 0 \Rightarrow m < 2$
 $S < 0 \rightarrow \frac{2(m+1)}{m-2} < 0 \Rightarrow -1 < m < 2 \Rightarrow m \in (-1, 2)$
 $\alpha < 0, \beta > 0 \Rightarrow \alpha + \beta < 0$

$|a| > |b| \rightarrow \alpha + \beta < 0$

الف) $P < 0 \rightarrow \frac{1}{m-2} < 0 \Rightarrow m < 2$
 ب) $-\frac{b}{2a} = x \Rightarrow -\frac{b}{2a} = -2 \Rightarrow \frac{b}{2a} = 2 \Rightarrow \frac{-2m-2}{2m-2} = 2 \Rightarrow m \geq 1$

$\frac{2}{x}x^2 - (2\sin\alpha)x + \frac{2}{x}$
 $\Delta \geq 0 \rightarrow 4\sin^2\alpha - 4 \cdot \frac{2}{x} \cdot \frac{2}{x} \geq 0 \Rightarrow \sin^2\alpha \geq 1 \Rightarrow \sin\alpha = 1, -1$
 $S = \frac{b}{a} > 0 \rightarrow \frac{2\sin\alpha}{\frac{2}{x}} > 0 \Rightarrow \sin\alpha > 0$

$\sin\alpha \geq 1 \Rightarrow \frac{2}{x}x^2 - 2x + \frac{2}{x} \geq 0 \Rightarrow 2x^2 - 12x + 4 \geq 0 \Rightarrow (2x-3)^2 \geq 0 \Rightarrow x \geq \frac{3}{2}$

$y_2 \frac{(ra^r - ra - 1)(ra^r - ra - \delta)}{1 - a^r} = \frac{(a-1)(ca+1)(a+1)(ra-\delta)}{(1-a)(1+a)}$ $\Rightarrow -9a^r + 1ca + \delta \Rightarrow \text{mod} \left \frac{-b}{ra} \right \frac{1r}{1r} (1-a)(1+a)$ $ra^r - ra - 1 \rightarrow \begin{cases} a^r - ra - c = (a-c)^r + (a+1) \\ (a-1)(ca+1) \end{cases}$ $ra^r - ra - \delta = a^r - ra - 1 + 1 - \delta = (a-\delta)(a+1) \rightarrow ra^r - ca - \delta = (ra-\delta)(a+1)$	f
$m a^r - (m+r)a - r = 0$ $s = \frac{-b}{a}, p = \frac{c}{a}$ $r s = \Delta p + V \Rightarrow \frac{r(m+r)}{m} \Delta x = \frac{r}{m} + V \rightarrow m = f$ $\Rightarrow f a^r - 9 a r - r = 0$ $a^r + B^r = s^r - r p \Rightarrow \left(\frac{r}{f}\right)^r - r \left(-\frac{r}{f}\right) = \frac{1r}{f}$	v
$\frac{f a + B^a}{\Delta B^r} = \frac{f a}{\Delta B^r} + \frac{B^r}{a} \rightarrow \frac{a^r}{\delta} + \frac{B^r}{a} \Rightarrow \frac{1}{\delta} (a^r + B^r)$ $\Rightarrow \frac{1}{\delta} (s^r - c s p)$ $a^r - \Delta a + r = 0$ $\begin{aligned} p = r &\rightarrow a B = r \rightarrow B = \frac{r}{a} \rightarrow B^r = \frac{f}{a^r} \Rightarrow \frac{1}{\delta} (1r\delta - r) = 19 \\ s = \delta \\ p = r \end{aligned}$	1
$y_1 = x a^r + b a + c \xrightarrow{a_1} c = y \rightarrow c = f$ $y_2 = r a + 1 \xrightarrow{a_2} y_2 = f$ $y_1 \xrightarrow{a_1} f a + r b + c = f \rightarrow f a + r b = 1 - c \rightarrow 1 - a = 1 - c \rightarrow \begin{matrix} a = 1 \\ b = c \end{matrix}$ $y_2 \xrightarrow{a_2} f a = c b + c = f \rightarrow f a - c b = 0 \rightarrow c a = b$	9
$y_2 = r a^r + (m+1)a + m + f$ $\hookrightarrow r a^r + (m+1)a + m + f = 0 \rightarrow r a^r + m a + m + f = 0 \rightarrow \Delta = 0 \Rightarrow m^r - f(rm + 1r) = 0$ $\rightarrow m^r - 1m - 1r = 0 \Rightarrow (m-1r)(m+1) = 0$ $\rightarrow m = \frac{m+1r}{m-1r}$ $i.e. \Rightarrow a = y$ $m = 1r \rightarrow r a^r + 1r a + 1 = 0 \rightarrow a^r + 9 a + 9 = 0 \Rightarrow a = -c \text{ and } b = 0 \Rightarrow m < 1r$ $m = -f \rightarrow r a^r - f a + r \rightarrow a^r - r a + 1 = 0 \rightarrow a = 1 \rightarrow y = r - r = 0$	1.