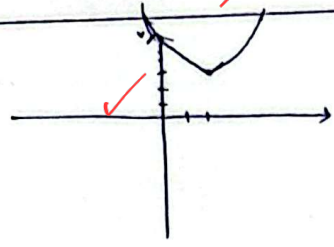
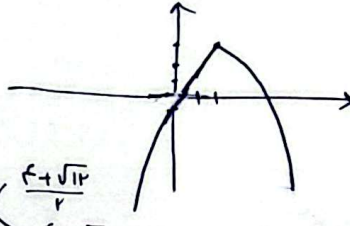


19,5

الف) $y = u^2 - 2u + 3$
 $\frac{f}{r} = 2$
 $f = 2 + 3 = 5$



ب) $y = -u^2 + 2u - 1$
 $\frac{-f}{-r} = 2$
 $-f + 1 = 2 \Rightarrow f = -1$



$\frac{-f \pm \sqrt{14 - f}}{-r} = \frac{-f \pm \sqrt{1r}}{-r} < \frac{f + \sqrt{1r}}{r}$

$2u^2 + (m+1)u + \frac{1}{r}m + 1 = 0$

$\Delta = 0 \Rightarrow m^2 - 2m - 1 = 0$
 $(m-1)(m+1) = 0 \Rightarrow m = 1$
 $2u^2 + 3u + \frac{1}{2} = 0 \Rightarrow u = -1, -\frac{1}{2}$
 $2u^2 - 2u + \frac{1}{2} = 0 \Rightarrow u = \frac{1}{2}, 1$

$\Delta > 0$
 $m^2 - 2m - 1 > 0$
 $(m-1)(m+1) > 0$
 $(-\infty, -1) \cup (1, +\infty)$

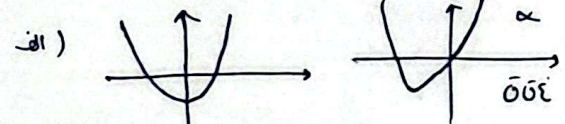
$\Delta > 0$
 $(m+1)^2 - f(r)(\frac{1}{r}m + 1) > 0$
 $m^2 + 1 + 2m - fm - 1 = 0$
 $m^2 - 2m - 1 > 0$
 $(-\infty, -1) \cup (1, +\infty)$
 $\Delta < 0$
 $m^2 - 2m - 1 < 0$
 $(m-1)(m+1) < 0$
 $(-1, 1)$

$y = (m-2)u^2 - 2(m+1)u + 1$

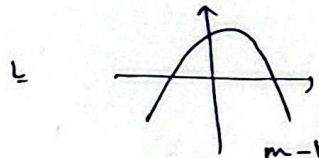
$\Delta > 0 \Rightarrow f(m+1)^2 - f(1)(m-2) > 0 \Rightarrow fm^2 + 4m + 1 - fm + 2 = 0$
 $\Delta < 0 \Rightarrow \frac{r(m+1)}{(m-2)} < 0$
 $\Delta > 0 \Rightarrow \frac{1}{m-2} > 0$
 $\Delta < 0 \Rightarrow \frac{-1}{m-2} < 0$
 $\Delta < 0 \Rightarrow \frac{r}{-r+1} < 0$
 $(-\infty, 2)$

$\Delta > 0 \Rightarrow m^2 - 2m + 1 > 0$
 $\Delta < 0 \Rightarrow \frac{r(m+1)}{(m-2)} < 0$
 $\Delta > 0 \Rightarrow \frac{1}{m-2} > 0$
 $\Delta < 0 \Rightarrow \frac{-1}{m-2} < 0$
 $\Delta < 0 \Rightarrow \frac{r}{-r+1} < 0$
 $(-\infty, 2)$

$y = (m-2)u^2 - 2(m+1)u + 1$



$\Delta > 0 \Rightarrow m^2 - 2m + 1 > 0$
 $\Delta < 0 \Rightarrow \frac{r(m+1)}{(m-2)} < 0$
 $\Delta > 0 \Rightarrow \frac{1}{m-2} > 0$
 $\Delta < 0 \Rightarrow \frac{-1}{m-2} < 0$
 $\Delta < 0 \Rightarrow \frac{r}{-r+1} < 0$
 $(-\infty, 2)$



$\Delta > 0 \Rightarrow m^2 - 2m + 1 > 0$
 $\Delta < 0 \Rightarrow \frac{r(m+1)}{(m-2)} < 0$
 $\Delta > 0 \Rightarrow \frac{1}{m-2} > 0$
 $\Delta < 0 \Rightarrow \frac{-1}{m-2} < 0$
 $\Delta < 0 \Rightarrow \frac{r}{-r+1} < 0$
 $(-\infty, 2)$

4) $\frac{P(m+1)}{Pm-1} = -P$

$\frac{P(m+1)}{Pm-1} = -P$

$\frac{Pm+P}{Pm-1} = -P \Rightarrow Pm+P = -Pm+1$
 $4m \leq 4 \Rightarrow \boxed{m \leq 1}$

-4

$\frac{Pn^r}{P} - (P \sin \alpha) n + \frac{P}{P} = 0$
 $\Delta \Rightarrow P \sin \alpha - P \left(\frac{P}{P} \right) \left(\frac{P}{P} \right) > 0 \rightarrow \sin \alpha < 1 \Rightarrow \sin \alpha \leq 1 \Rightarrow \sin \alpha \leq \pm 1$
 $\sin \alpha \leq 1 \Rightarrow \frac{Pn^r}{P} - Pn + \frac{P}{P} = 0 \Rightarrow Pn^r - Pn + 1 = 0 \quad (Pn - P)(Pn - 1) = 0 \quad \boxed{n = \frac{P}{P}}$
 $\frac{Pn^r}{P} + Pn + \frac{P}{P} = 0 \Rightarrow Pn^r + Pn + 1 = 0 \quad (Pn + 1)^P \Rightarrow n \leq -\frac{P}{P} \Rightarrow \boxed{n \leq -1}$

5

$y = \frac{(Pn^r - Pn - 1)(Pn^r - Pn - 2)}{1 - Pn^r} = \frac{4n^r - 9n^r - 12n^r - 6n^r + 4n^r + 12n^r - Pn^r + Pn + 2}{1 - Pn^r}$
 $\frac{4n^r - 13n^r - 11n^r + 12n^r + 2}{1 - Pn^r} = \frac{4n^r - 13n^r - 11n^r + 12n^r + 2}{1 - Pn^r} \cdot \frac{Pn^r - 1}{4n^r - 13n^r - 11n^r + 12n^r + 2}$
 $\frac{(Pn^r - 1)(4n^r - 13n^r - 11n^r + 12n^r + 2)}{(Pn^r - 1)} = 4n^r - 13n^r + 2$
 $\frac{-\Delta}{Pn^r} \leq \frac{(149 - 13 \cdot 4 \cdot 1)}{Pn^r} \leq \frac{Pn^r}{Pn^r}$

-4

5

$m n^r - (m+1)n - 1 = 0$
 $P(\alpha + \beta) = 2\alpha\beta + V$
 $P\left(\frac{m+1}{m}\right) = 2\left(\frac{-P}{m}\right) + V = \frac{Pm+4}{m} \cdot \frac{-1}{m} + V \Rightarrow \frac{Pm+4}{m} = V \Rightarrow Pm+4 = Vm$
 $Pm = 4 \Rightarrow \boxed{m \leq 4}$

-V

5

$n^r - 2n + 1 = 0$
 $\frac{P\alpha + \beta}{\alpha\beta} = \frac{P\alpha}{\alpha\beta} + \frac{\beta}{\alpha} \Rightarrow \frac{P\alpha}{\alpha\left(\frac{P}{\alpha}\right)} + \frac{\beta}{\alpha} = \frac{\alpha^r}{\alpha} + \frac{\beta^r}{\alpha} = \frac{\alpha^r + \beta^r}{\alpha} = \frac{2\alpha}{\alpha} = 2$
 $\alpha^r + \beta^r = 2\alpha \Rightarrow 12\alpha - P(\alpha) = 2\alpha \Rightarrow 9\alpha = 0$

-1

5

$y_1 = an^r + bn + \frac{P}{P}$
 $y_2 = Pn + 1$
 $ya + Pn + 1 = 1 \Rightarrow 12a + 4b = P$
 $aa - cb + \frac{P}{P} = P \Rightarrow 11a - 4b = P$
 $\frac{P}{P} \Rightarrow \boxed{m \leq \frac{P}{P}}$

-4

5

$4, Pn^r + (m+1)n + m+4$
 $y \leq n$
 $Pn^r + (m+1)n + m+4 \leq n$
 $\Rightarrow Pn^r + mn + m+4 \leq 0$
 $m^r - P(m+1) = 0$
 $m^r - 12m - 12 = 0$
 $(m-12)(m+1) = 0$
 $\boxed{m \leq 12}$
 $\boxed{m \leq -1}$

-10

5