

$$f(x) = \begin{cases} x^{r-1} & x \leq 1 \\ ax+b & 1 \leq x \leq r \\ x^r & x \geq r \end{cases}$$

if $x=1 \rightarrow x^{r-1} = a \cdot 1 + b$
 $a+b=0$
if $x=r \rightarrow a \cdot r + b = r^r$
 $ra+b=r^r$
 $\begin{cases} a+b=0 \\ ra+b=r^r \end{cases} \xrightarrow{a=-b} b=-r \quad \{a \times b = -r^r\}$

$$rk-r = \varepsilon - rk \quad \omega k = v \quad k = \frac{v}{a} \quad k = 1/\varepsilon$$

ادامسوال (ب) 4 $\rightarrow (y_1 - y_2) \left((y_1^r + y_2^r + y_1 y_2) + r(y_1 - y_2) \right) = (y_1^r + y_2^r + y_1 y_2 + r^2)(y_1 - y_2) = 0$

if $y_1 = y_2 \rightarrow z = 0$

$y_1^r + y_2^r + y_1 y_2 + r \rightarrow \Delta = y_1^r - r - \varepsilon y_1^r = -\varepsilon y_1^r - r < 0$ (ممنون)
 $r < \varepsilon$

اذا $y^r - \varepsilon y = r^r - \varepsilon r^r$

if $x \rightarrow -1$
 $\ln x^r - \varepsilon x + r = 0$

$y^r (y - y_1) = 0$
 $y = r$
 $y = 0$

ب) $|x| + |y| = r \rightarrow$ if $x=0 \rightarrow y = r$
 $y = -r$

(X)

if $\sqrt{1 - \cos x} = r \rightarrow y = r$
 $y = -r$

(X)

2) $|y| = \sqrt{1 - \cos x} \quad -1 \leq \cos x \leq 1 \rightarrow \sqrt{1 - \cos x} \leq 1 \rightarrow \sqrt{1 - \cos x} = 0$ (X)

3) $y^r \cdot r^r - r^r = 0 \quad (y^r) + (r+1) = 0 \quad y \rightarrow 0$
 $x \rightarrow -1$ (✓)

اذا $\sqrt{y} + r = r^r - r \rightarrow \sqrt{y} = -r^r + r^r - r$ if $m_1 = m_2$
 $y_1 = y_2$

$\sqrt{y_1} = -r^r + r^r - r \quad \sqrt{y_2} = -r^r + r^r - r$

if $m_1 = m_2 \rightarrow -r^r + r^r - r = -r^r + r^r - r \rightarrow \sqrt{y_1} = \sqrt{y_2} \rightarrow y_1 = y_2$

ب) $y + ry = \omega x$

$y_1 + ry_1 = \omega x_1$

$y_2 + ry_2 = \omega x_2$

if $m_1 = m_2 \rightarrow y_1 = y_2 \rightarrow \omega x_1 = \omega x_2 \rightarrow y_1 + ry_1 = y_2 + ry_2 \rightarrow y_1 - y_2 = ry_2 - ry_1$

اذا $x \sin y = y \sin x$

if $x = \pi \rightarrow \pi \cdot \varepsilon \sin y = 0$
 $\sin \pi \cdot \varepsilon = 0$

$\pi \cdot \varepsilon \sin y = 0$
 $y = 0$
 $y = \pi \cdot \varepsilon$

ب) $\sqrt{\frac{x}{y}} + \sqrt{\frac{y}{x}} = r \sin \frac{\pi}{2} \rightarrow \frac{x}{y} + \frac{y}{x} + r = \frac{r}{2} \xrightarrow{\times xy} x^2 + y^2 = rxy$

$x^2 + y^2 - rxy = 0 \quad (x-y)^2 = 0 \quad (x=y)$ (✓)

الف) $6x^2 - 5x - 4 \Rightarrow x^2 - 5x - 34 \Rightarrow (x-9)(x+4) \quad x_1 = \frac{3}{4} \quad x_2 = -\frac{3}{4}$
 ب) $3x^2 - 11x - 3 \Rightarrow x^2 - 11x - 9 \Rightarrow (x-9)(x+1) \quad x_1 = 3 \quad x_2 = -\frac{1}{3}$
 2) $4x^2 - 4x - 3 \Rightarrow x^2 - 4x - 12 \Rightarrow (x-6)(x+2) \quad x_1 = \frac{3}{2} \quad x_2 = -\frac{1}{2}$
 د) $2x^2 - 5x - 12 \Rightarrow x^2 - 5x - 24 \Rightarrow (x-8)(x+3) \quad x_1 = 4 \quad x_2 = -\frac{3}{4}$

الف) $\rightarrow (x-7)(x+2) \rightarrow x_1 = 7 \quad x_2 = -2$
 ب) $\rightarrow 2x^2 + 5x + 3 \rightarrow \cancel{x^2 - 5x - 6} \rightarrow \Delta = 25 - 24 = 1$
 $\frac{-5 \pm 1}{2} \Rightarrow (-\frac{3}{2}, -1)$
 2) $\rightarrow x^2 + 2x + 3 \quad \Delta < 0 \quad \times$
 د) $\rightarrow 3x^2 + 3x - 2 \rightarrow \Delta = 9 + 24 = 33 \quad \left(\frac{-3 \pm \sqrt{33}}{6} \right)$

$f(A \times B) = \{ (1,2) (1,3) (2,2) (2,3) (3,2) (3,3) \}$
 $f(B^T) = \{ (2,2) (2,3) (3,2) (3,3) \}$
 $f(A+B) - B^T = \{ (1,3) (1,2) \}$

الف) $f(x) = \{ (3, m^2) (2, 1) (-3, m) (-2, m) (3, m+2) (m, 4) \}$
 $m^2 = m+2 \rightarrow \frac{m^2 - m - 2}{(m-2)(m+1)} \rightarrow \begin{matrix} m=2 \\ m=-1 \end{matrix}$
 if $m=2 \quad (2,1) \text{ و } (2,4) \text{ غنق}$
 if $m=-1 \quad (2,1) \text{ و } (2,4) \text{ غنق}$

ب) $g(x) = \{ (3, m^2) (2, 1) (m, 4) (3, m+2) (-2, m) (-1, 3) \}$
 $m^2 = m+2 \rightarrow \begin{matrix} m=2 & \text{if } m=2 & (2,1) \text{ و } (2,4) & \text{غنق} \\ m=-1 & \text{if } m=-1 & (-1,4) \text{ و } (-1,3) & \text{غنق} \end{matrix}$
 (هیچکدام!)

$a^2 = 3a - 2 \Rightarrow a^2 - 3a + 2 \Rightarrow (a-1)(a-2) \quad a = \begin{matrix} (2)^{\checkmark} \\ (1)^{\times} \end{matrix}$
 if $a \rightarrow 1 \rightarrow f(x) = \{ (1,1) (1,1) (1,4) \}$ غنق $\times$
 (a=2)
 if $a \rightarrow 2 \rightarrow f(x) = \{ (1,4) (1,4) (4,1) \}$ ✓