

سؤال یک) $a^r + 2a = a^r - r \rightarrow a = -r$

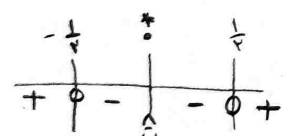
سؤال دو) $r = r(r) + b \rightarrow b = -1$
 $r = \frac{r+a}{8} \rightarrow a = 11$
 $f(x) = \frac{x^r + 11}{r^{x+1}}$
 $g(x) = r^x - 1$
 $f(1) = \frac{1^r}{r} = r$


سؤال سه) $\alpha(x+1)(x-r) \rightarrow \alpha x^2 - \frac{r\alpha}{-1}x - \frac{r\alpha}{-1} = rx^2 + ax + b$
 $\alpha = r$ $a = -r$ $b = -r$

$f(x) = \frac{rx+1}{rx^2-4x-1} \rightarrow f(1) = \frac{8}{r-4-1} \rightarrow -\frac{8}{1r}$

سؤال چهار) $\alpha(x+1)^r \Rightarrow \alpha x^r + rx\alpha + \alpha = -rx^r + ax + b \Rightarrow \alpha = -r / b = -r / a = -r$
 $a + b = -r - r = -2r$

سؤال پنج) $x^2 + mx + 1 \Rightarrow \Delta < 0 \rightarrow m^2 - 4 < 0 \rightarrow -2 < m < 2$

سؤال شش) $r - \frac{1}{x^r} \geq 0 \rightarrow \frac{rx^r - 1}{x^r} \geq 0$
 $rx^r = 1 \rightarrow x = \pm \frac{1}{r}$
 $x = 0$

 $D_f = (-\infty, -\frac{1}{r}] \cup [\frac{1}{r}, \infty)$

سؤال هفت) $m > 0, \Delta < 0 \rightarrow \Delta < 0 \rightarrow 4m^2 - 4m < 0 \rightarrow 4m(m-1) < 0$

 $m > 0, m < 1 \Rightarrow 0 < m < 1$

سؤال هشت) $D_f f(x) = D_f g(m) \rightarrow rx(\frac{1}{r}) + k = r \rightarrow k = 0$
 $a \rightarrow rx - 1 \neq 0 \rightarrow x = \frac{1}{r} = a$
 $a + k = \frac{1}{r}$

$$\text{if } x=1 \Rightarrow f(1) = 1 = g(1) = 3+b \rightarrow \underline{b = -2}$$

(سؤال ٢)

$$g(x) = 3x - 2 \rightarrow x = \frac{2}{3} \Rightarrow -2$$

$$f(x) = 3ax + 2 \rightarrow x = \frac{2}{3} \Rightarrow -2a + 2 \quad \left. \vphantom{f(x)} \right\} \rightarrow -2 = -2a + 2 \rightarrow \underline{a = 2}$$

$$\underline{3+2 = 5}$$

$$\text{if } x=2 \rightarrow f = 2a^2 + 2a \rightarrow a^2 + a - 2 = 0 \rightarrow \underbrace{(a+2)}_{-2} \underbrace{(a-1)}_{1} = 0$$

(سؤال ٥)