

۱)  $a^2 + 2a = a^2 - 4 \rightarrow 2a = -4 \rightarrow a = -2$  ✓ ۲ هر دو  $a = a$

۲)  $f(x) = \frac{x+a}{x-b} = 3 \rightarrow 12 - 2b = 4 + a \rightarrow 12 + 3 = 4 + a \rightarrow a = 11$  ✓ ۲

$g(x) = 4 + b = 3 \rightarrow b = -1$  ✓  $f(1) = \frac{1+11}{2+1} = \frac{12}{3} = 4$  ✓ ۲

۳)  $(x+1)(x+4) = x^2 - 2x - 4$  باید ریشه استخراج - و کما شانس

$\rightarrow x^2 - 2x - 4 = 0$  ۲

$f(x) = \frac{4x+1}{2x^2-2x-1} \rightarrow f(1) = \frac{5}{-1} = -\frac{5}{1}$  ✓ ۲

۴)  $(x+1)(x+1) = x^2 + 2x + 1$  ریشه استخراج - و چون توان ۲ داده پس ریشه منفی

$\rightarrow x^2 + 2x + 1 = x^2 - 4x - 4$

$\rightarrow a = -1$  ✓  $\rightarrow a+b = -1-4 = -5$  ✓ ۲

۵)  $(m^2 + mm + 1)$  ۲

$\Delta < 0 \rightarrow m^2 - 4 < 0 \rightarrow (m-2)(m+2) < 0$  \*

$(m-1)^2 = m^2 + 1 - 2m \rightarrow m = -2$  \*

$* \cup * = -2 \leq m < 2$  ✓ ۲

۶)  $x - \frac{1}{x^2} \geq 0 \rightarrow (x - \frac{1}{x})(x + \frac{1}{x}) \geq 0$  ۲

$\frac{-\frac{1}{x}}{+\frac{1}{x}} \rightarrow (-\infty + \frac{1}{x}] \cup [\frac{1}{x} + \infty)$

۷)  $mx^2 + 2mx + 1 \geq 0$  ۲

$\Delta \leq 0 \rightarrow 4m^2 - 4m \leq 0 \rightarrow 4m(m-1) \leq 0$

$0 \leq m \leq 1$  ✓ ۲

جواب

$$\textcircled{7} \frac{r a^r - 1}{r a - 1} = \frac{(r a - 1)(r a + 1)}{r a - 1} = r a + 1$$

$$\hookrightarrow r a - 1 = 0 \rightarrow r a = 1 \rightarrow a = \frac{1}{r} \xrightarrow{\text{و}} a \neq a \rightarrow a \neq \frac{1}{r} \rightarrow a = \frac{1}{r} \checkmark$$

$$a = \frac{1}{r} \rightarrow f\left(\frac{1}{r}\right) + k = r\left(\frac{1}{r}\right) + 1 \rightarrow r + k = 1 + 1 \rightarrow k = 0 \quad a + k = 0 + \frac{1}{r} = \frac{1}{r} \checkmark$$

$$\textcircled{9} \frac{r a^r - r}{r a + r} = r a + b \rightarrow \frac{(r a + r)(r a - r)}{r a + r} = r a - r = r a + b \rightarrow b = -r \checkmark$$

$$-r a + r = -r + b \xrightarrow{b = -r} -r a + r = -r \rightarrow -r a = -r \rightarrow a = 1 \checkmark$$

$$a - b = 1 - (-r) = 1 + r \checkmark$$

$$\textcircled{10} \frac{r a^r - r}{r a - r} = \frac{(a - r)(a + r)}{a - r} = a + r$$

$$r a^r + r a = r \rightarrow r a^r + r a - r = 0 \rightarrow a^r + a - 1 = 0 \rightarrow (a + r)(a - 1) = 0$$

↓

$$a = r$$

$$\begin{matrix} a = -r \\ a = 1 \end{matrix} \checkmark$$