

افزایش!

$$a^r + 2a = a^r - r \Rightarrow 2a = -r$$

$$\Rightarrow a = \boxed{-\frac{r}{2}} \quad \checkmark$$

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$$f(x) = \frac{x^r + a}{2x - b} \Rightarrow f(x) = \frac{x^r + a}{2x + 1} \xrightarrow{(2, r)} r = \frac{r+a}{2} \Rightarrow r+a = 15 \Rightarrow a = 11 \quad \checkmark$$

$$g(x) = 2x + b \xrightarrow{(2, r)} r = 2(r) + b \Rightarrow b = -1 \quad \checkmark$$

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$$f(x) = \frac{x^r + 11}{2x + 1} \longrightarrow f(1) = \frac{1^r}{2} = \frac{1}{2} \quad \checkmark$$

$$f(x) = \frac{r x + 1}{2x^r + a x + b}$$

$$D_f = \mathbb{R} - \{-1, r\} \rightarrow \text{ریشه های خروج} \Rightarrow 2(x+1)(x-r) = 2x^2 - 2rx - 2r$$

$$f(x) = \frac{r x + 1}{2x^2 - 2rx - 2r} \longrightarrow f(1) = \frac{0}{-1^r} \quad \checkmark$$

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$$f(x) = \frac{2x^r - \sqrt{r}}{-r x^r + a x + b}$$

$$D_f = \mathbb{R} - \{-1\} \rightarrow \text{ریشه خروج} \Rightarrow -r(x+1)^r = -r x^r - r x - r \Rightarrow a = -r, b = -r \quad \checkmark$$

$$a + b = -r - r = \boxed{-2r} \quad \checkmark$$

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$$f(x) = \frac{2x}{(x-1)(x^r + m x + 1)}$$

$$D_f = \mathbb{R} - \{1\} \rightarrow \text{ریشه خروج} \Rightarrow \left\{ \begin{array}{l} x^r + m x + 1 = (x-1)^r \Rightarrow m = -r \\ \Delta < 0 \Rightarrow m^2 - r < 0 \Rightarrow (m+r)(m-r) < 0 \Rightarrow -r < m < r \end{array} \right.$$

$$\frac{-r \quad r}{+ \quad - \quad - \quad +}$$

[۲، r]  $\checkmark$

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$$f(x) = \sqrt{x - \frac{1}{x^2}}$$

1)  $x \neq 0$       2)  $x - \frac{1}{x^2} \geq 0 \Rightarrow \frac{x^3 - 1}{x^2} \geq 0 \Rightarrow \frac{(x-1)(x+1)}{x^2} \geq 0$

نقاط حرجية \*  $(-\infty, -\frac{1}{x}]$

$$\Rightarrow D_f = [-\frac{1}{x}] \cup [\frac{1}{x}, +\infty)$$

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6

$$f(x) = \sqrt{mx^2 + 1}$$

$D_f = \mathbb{R}$   $\begin{cases} m > 0 \\ \Delta \leq 0 \end{cases} \Rightarrow 4m - 1 \leq 0 \Rightarrow 4m \leq 1 \Rightarrow m \leq \frac{1}{4}$   $\frac{0}{+ \phi - \phi +} \Rightarrow [0, \frac{1}{4}]$  ✓

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7

$$f(x) = \begin{cases} \frac{x^2 - 1}{x - 1} & ; x \neq 1 \\ x + k & ; x = 1 \end{cases}$$

$f(x) = g(x) \Rightarrow Dg = Df$   $Dg = \mathbb{R} \Rightarrow a = \frac{1}{x}$  ✓  $\rightarrow$  رتبة متخرج

$g(x) = x + 1$

$g(\frac{1}{x}) = f(\frac{1}{x}) \Rightarrow x(\frac{1}{x}) + 1 = (\frac{1}{x}) + k \Rightarrow x = \frac{1}{x} + k \Rightarrow k = 0$  ✓  
 $a + k = \frac{1}{x}$  ✓

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8

$$f(x) = \begin{cases} \frac{9x^2 - 4}{x + 2} & ; x \neq -\frac{2}{3} \\ 2ax + 2 & ; x = -\frac{2}{3} \end{cases}$$

$f(x) = g(x)$   $f(x) = g(x) = \frac{9x^2 - 4}{x + 2} = 1 = 2 + b \Rightarrow b = -2$  ✓  
 $f(-\frac{2}{3}) = g(-\frac{2}{3}) = -2 - 2 = -4 = -2a + 2 \Rightarrow a = 3$  ✓

$g(x) = 2x + b$

$a - b = 3 - (-2) = 5$  ✓

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9

$$f(x) = \begin{cases} \frac{x^2 - 4}{x - 2} & ; x \neq 2 \\ ya^2 + ax & ; x = 2 \end{cases}$$

$f(x) = g(x) \Rightarrow f(2) = g(2) = 2 + 2 = 4 = ya^2 + 2a$   
 $\Rightarrow ya^2 + 2a - 4 = 0 \rightarrow a^2 + 2a - 4 = (a+4)(a-2) = 0 \Rightarrow$   $\begin{cases} a = -4 \\ a = 2 \end{cases}$  ✓

$g(x) = x + 2$

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10