

الف) $f(x) = \sqrt{x|x|}$, $g(x) = x$

برابر نیستند

۱- ۵

$x = -1 \rightarrow \begin{cases} f(-1) = \sqrt{-1|-1|} \rightarrow \text{تعریف نمی شود} \\ g(-1) = -1 \end{cases}$

ب) $f(x) = \frac{(x+3)(x+1)+x+4}{x^2+5x+7}$, $g(x) = 1$

$\Delta b^2 - 4ac = 25 - 28 = -3$

برابرند

$\frac{(x+3)(x+1)+x+4}{(x+3)(x+1)+x+4} = 1$

پس همیشه ندارد

ج) $f(x) = \frac{2\sin^2 x - 3\sin x}{2\sin x - 3}$, $g(x) = 2\sin x$

برابرند

$\frac{2\sin x (2\sin x - 3)}{2\sin x - 3} = 2\sin x$

همچون ماه صفر
یعنی شود

د) $f(x) = \frac{x}{|x|}$, $g(x) = \frac{|x|}{x}$

برابرند

$Df = R - \{0\}$ $Dg = R - \{0\}$

الف) $f(x) = \left[\frac{x^2}{x^2+1} \right]$, $g(x) = [x - [x]]$

برابرند

۲- ۵

$x^2+1 \neq 0$ $Df = R$ $Dg = R$

بدیسی

ب) $f(x) = \frac{1}{[2x]}$, $g(x) = \frac{1}{2[x]}$

$x = \frac{1}{2} \rightarrow f(\frac{1}{2}) = \frac{1}{[1]}$, $g(\frac{1}{2}) = \frac{1}{2[\frac{1}{2}]}$

برابر نیستند

ج) $f(x) = \frac{1}{\sqrt{x-|x|}}$, $g(x) = \frac{1}{\sqrt{|x|-x}}$

تعریف نشده

$x = -3 \rightarrow f(x) = \frac{1}{\sqrt{-6}}$, $g(x) = \frac{1}{\sqrt{6}}$

برابر نیستند

د) $f(x) = \begin{cases} \frac{x^3-x}{x-1} & x \neq 1 \\ 2 & x = 1 \end{cases}$, $g(x) = x^2+x$

$\frac{x^3-x}{x-1} = \frac{x(x^2-1)}{x-1} = \frac{x(x-1)(x+1)}{(x-1)} = x^2+x$

برابرند

$$f(x) + g(x) = x^2 + x + 1, \quad f(x) - g(x) = x^2 - x + 1 \quad -3$$

$$\text{الف)} \quad f'(x) - g'(x) = (f(x) + g(x)) + (f(x) - g(x)) = (x^2 + x + 1) + (x^2 - x + 1) = x^2 + x^2 + x - x + 1 + 1 = 2x^2 + 2$$

$$\text{ب)} \quad \left. \begin{aligned} f(x) + g(x) &= x^2 + x + 1 \\ f(x) - g(x) &= x^2 - x + 1 \end{aligned} \right\} \begin{aligned} 2f(x) &= 2x^2 + 2 \\ f(x) &= x^2 + 1 \\ g(x) &= x \end{aligned}$$

3

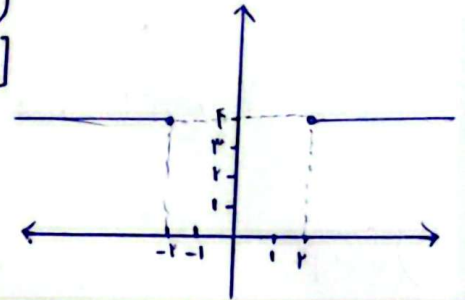
$$f(x) = x - \sqrt{x^2 - 4} \quad g(x) = x + \sqrt{x^2 - 4} \quad -4$$

5

$$f \cdot g = (x - \sqrt{x^2 - 4})(x + \sqrt{x^2 - 4}) = x^2 - (\sqrt{x^2 - 4})^2 = x^2 - (x^2 - 4) = 4$$

$$\sqrt{x^2 - 4} \rightarrow x^2 - 4 \geq 0 \rightarrow x^2 \geq 4 \rightarrow x \geq 2 \quad [2, +\infty)$$

$$x \leq -2 \quad (-\infty, -2]$$



$$2x^2 - 3x - 4 \Rightarrow x^2 - 3x - 2 \Rightarrow (x - 4)(x + 1) \Rightarrow x \rightarrow \frac{4}{1} = 4$$

-4

$$x^2 - mx + n = (x - 4)(x + 1) = x^2 - 4x - 4$$

$$\rightarrow -\frac{r}{p} = -1$$

$$\Rightarrow m = +4, \Delta \checkmark$$

$$n = -4, \Delta \checkmark$$

$$x - b = ax + r$$

$$x(1 - a) = b + r \Rightarrow b = -r$$

$$1 \cdot 4 - 4 = -4$$

$$am - bn \rightarrow$$

0, 1, 4

$$\wedge x + b \neq 0 \quad x \neq -\frac{b}{\wedge} \quad a = -\frac{b}{\wedge} = \pm \frac{1}{r}$$

$$\wedge x \neq -b$$

$$b(-\frac{b}{\wedge}) + r = 0 \Rightarrow -\frac{b^2}{\wedge} = -r \Rightarrow \frac{b^2}{\wedge} = r \Rightarrow b^2 = \wedge r$$

$$b = \pm \sqrt{\wedge r}$$

بازرسی جواب

$$\xrightarrow{x=1} \frac{\pm \sqrt{r} + r}{\wedge \pm r} = \pm \frac{1}{r} = c$$

$$-\frac{1}{r} \times r = -1$$

$$\frac{1}{r} \times r = 1$$

5 -9

$$2f-1 = \{(-1, 3), (2, 7), (3, -5), (0, 0)\} \rightarrow f = \{(-1, 2), (2, 4), (3, -2), (0, 1)\}$$

$$g = \{(2, 4), (3, 6), (-1, -4), (5, 0)\}$$

$$\frac{2g}{f+g} \rightarrow \left\{ \begin{array}{l} \{(2, 8), (3, 12), (-1, -8), (5, 0)\} \\ \{(-1, -2), (2, 8), (3, 4)\} \end{array} \right\} \rightarrow \{(2, 1), (1, 4), (2, 2)\}$$

↓
{1, 4, 2}

$$a = d = -1$$

$$a - 3b = c$$

$$3a - 2b = 1$$

- 1

$$-1 - 3b = c$$

$$-3 - 2b = 1$$

5

$$-1 - 3(-2) = c$$

c = 5

$$-3 - 1 = 2b \Rightarrow b = -2$$

$$d + c = -1 + 5 = 4$$

$$-x^2 + x - m \rightarrow \Delta = 0 \rightarrow 1 - 4(-1)(m) = 0$$

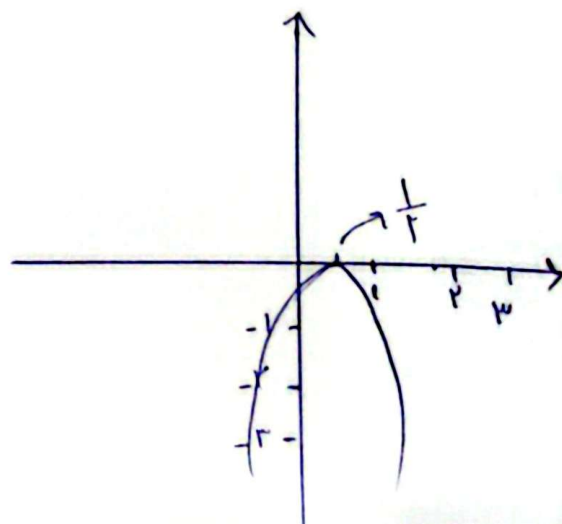
زیرا نقطه یک ریشه داریم که a است.

$\frac{1}{4}$

9

$$-x^2 + x - m \xrightarrow[\max]{a < 0} \frac{-b}{2a} = \frac{-1}{-2} = \boxed{\frac{1}{2}} \rightarrow a \quad 0 + \frac{1}{2} = \frac{1}{2}$$

$$-\frac{\Delta}{4a} = \frac{\Delta=0}{4a} = 0 \rightarrow b$$



۳

-10

$$\frac{291 + a}{(x - c)r} = \frac{291 + a}{x^2 - 2cx + c^2} = \frac{291 + a}{x^2 + 9x + b}$$

$$\xrightarrow{x=1} \frac{2+a}{1+9+9} = \frac{2}{12}$$

$$9 + 9 - 2 = 12$$