

$$y = \sqrt{xg}$$

$$y = \sqrt{x f(x)}$$

$$Df = [x, \omega] \cup [-\omega, \omega]$$

xy > 0

$$\begin{array}{ccccccc} -4 & -2 & 0 & 2 & 4 \\ \hline & - & + & - & + \\ \hline \end{array}$$

1,5

$$y = \sqrt{\frac{-x}{f(x)}}$$

$$\frac{-x}{f(x)} \geq 0$$

$$f(x) \neq 0$$

تقین علامت

کامل نبوی

$$\begin{array}{ccccccc} -2 & -1 & 0 & 1 & 2 & 3 & 4 \\ \hline & + & - & - & - & + & \\ \hline \end{array}$$

$$Dy = (-2, 2) - \{0\}$$

$$x < 0 \rightarrow f(x) > 0 \Rightarrow -1, 2$$

$$x > 0 \rightarrow f(x) < 0 \Rightarrow 1$$

$$f(0) \neq 0 \leftarrow x \neq 0$$

$$Dy = (-2, 2) - \{0\}$$

$$Df = \{1, -1, -2\}$$

1,5

$$f(x) - 2f(2) = x^2 - 2x + 4$$

$$f(-2) + 2 = 4 + 4 + 4$$

$$f(2) - 2f(2) = 4 - 4 + 4$$

$$f(-2) = 12$$

$$\frac{-f(2)}{-1} = \frac{4}{-1}$$

$$f(2) = -4$$

$$f(x) = x^2 - 3x \rightarrow f(-2) = (-2)^2 - (-4) = 1$$

1,5

$$f(f(2)) + f(f(1)) = 7 + 2 = 9$$

$$f(1) = 2(1) + 2 = 4$$

$$f(2) = 2$$

$$f(2) = 2(2) + 2 = 6$$

$$f(2) = 2(2) + 2 = 6$$

$$1 \leq 2$$

$$2 > 2$$

$$2 \leq 2$$

2

$$f(x) = ax^2 + bx + 2 \quad f(0) = 2$$

$$f(x+1) - f(x) = 4x + 2$$

$$f(0) - f(1) = 4 + 2$$

$$\frac{-f(1)}{-1} = \frac{4}{-1}$$

$$f(1) = -4$$

$$a - b + 2 = -4$$

$$a - b = -6$$

2

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

$$f(\sqrt{2} - 2) = \frac{((\sqrt{2} - 2) + 2)^2 + 1}{((\sqrt{2} - 2) + 2)^2 + 2} = \frac{2^2 + 1}{2^2 + 2} = \frac{5}{6}$$

2

$$f\left(x - \frac{1}{x}\right) = \frac{x^2 + 1}{x^2} = \frac{x^2}{x^2} + \frac{1}{x^2} = 1 + \frac{1}{x^2} \quad x \neq 0$$

2

$$f(x) = x^2 - 2$$

$$x - \frac{1}{x} = t \rightarrow \frac{1}{x} + x^2 = t^2 + 2$$

$$\Rightarrow f(t) = t^2 + 2, \quad t \neq 0$$

$$f(-2) = 9 + 2 = 11$$

Arman

الف) $\frac{f}{g} = \left\{ \left(\frac{2}{\sqrt{3}}, 0 \right), \left(1, \frac{-2}{\sqrt{3}} \right), \left(0, \frac{2}{3} \right) \right\}$

$g(x) = \sqrt{9-x^2}$ $g(0) = \sqrt{9} = 3$ $g(1) = \sqrt{9-1} = \sqrt{8} = 2\sqrt{2}$
 $g(2) = \sqrt{9-4} = \sqrt{5}$

ب) $\frac{f}{g} = \left\{ \left(\frac{2}{\sqrt{3}}, \frac{\sqrt{3}}{2} \right), \left(1, \frac{\sqrt{2}}{2} \right), \left(0, \frac{3}{2} \right) \right\}$

الف) $2f(x) = \left\{ \left(\frac{2}{\sqrt{3}}, 2 \right), \left(3, 8 \right), \left(-2, 4 \right), \left(1, 4 \right) \right\}$

ب) $f(x) + 1 = \left\{ \left(\frac{2}{\sqrt{3}}, \frac{3}{2} \right), \left(3, \frac{5}{2} \right), \left(-2, \frac{3}{2} \right), \left(1, \frac{5}{2} \right) \right\}$

ج) $3f^2(x) + 1 = \left\{ \left(\frac{2}{\sqrt{3}}, 4 \right), \left(3, 16 \right), \left(-2, 12 \right), \left(1, 12 \right) \right\}$

د) $f(2x) = \left\{ \left(\frac{4}{\sqrt{3}}, 2 \right), \left(2, 4 \right), \left(-4, 2 \right), \left(2, -2 \right) \right\}$

الف) $f-g = \left\{ \left(1, 4 \right), \left(2, 2 \right), \left(3, 2 \right) \right\}$

ب) $\frac{2f}{g} = \left\{ \left(\frac{4}{\sqrt{3}}, 2 \right), \left(2, 4 \right), \left(3, -2 \right) \right\}$