

$$x(f(x)) \geq 0$$

$$[-\infty, 0] \cup [2, \infty]$$

-1

	-2	-1	0	1	2	3
x	-	-	0	+	+	+
$f(x)$	+	0	-	-	0	+
$x(f(x))$	-	+	0	-	0	-

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

-2

	-2	-1	0	1	2	3
$-x$	+	+	0	-	-	-
$f(x)$	-	+	0	-	+	0
$P(x)$	-	+	0	+	0	-

$$D_p = (-1, 2) - \{0\} \rightarrow \text{مجموعه } 3$$

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

-3

$$f(2) - 2f(2) = 4 - 4 + 4 \rightarrow -f(2) = 4 \Rightarrow f(2) = -4$$

$$f(-2) - 2(-2) = 4 + 4 + 4 \rightarrow f(-2) + 4 = 12$$

$$f(-2) = 8$$

$$f(x) = \begin{cases} x - \sqrt{x+4}; & x > 2 \\ 2x+3; & x \leq 2 \end{cases} \quad \frac{f(f(\infty))}{\sqrt{}} + \frac{f(f(1))}{2} = 9$$

-4

$$f(\infty) = \infty - \sqrt{\infty+4} = \infty - 2 = 2$$

$$f(1) = 2(1) + 3 = 5$$

$$f(2) = 2(2) + 3 = 7$$

$$f(\infty) = \infty - \sqrt{\infty+4} = 2$$

$$f(x) = ax^2 - bx + 2$$

$$f(x-1) - f(x) = 9x + 2$$

-5

$$x=1 \rightarrow \begin{cases} f(0) = 2 \\ f(1) = a - b + 2 \end{cases}$$

$$2 - (a - b + 2) = 9 + 2$$

$$2 - a + b - 2 = 9 + 2$$

$$b - a = 9 + 2 - 2$$

$$b - a = 9$$

$$a - b = -9$$

$$f(x) = \frac{x^2 + 4x + 5}{x^2 + 4x + 7} = \frac{(x+2)^2 + 1}{(x+2)^2 + 3} = \frac{(\sqrt{3}-2+2)^2 + 1}{(\sqrt{3}-2+2)^2 + 3} = \frac{4}{4} = \frac{2}{2} \quad -6$$

$$f\left(x - \frac{1}{x}\right) = \frac{x^2 + 1}{x^2} \rightarrow f\left(x - \frac{1}{x}\right) = x^2 + \frac{1}{x^2} \rightarrow f\left(x - \frac{1}{x}\right) = \left(x - \frac{1}{x}\right)^2 + 1 \quad -7$$

$$f(-3) = (-3)^2 + 2 = 11$$

$$D_g = [-3, +3]$$

$$f(x) = \{(2,0), (1,-4), (0,2), (7,1)\}$$

-8

$$\text{الف)} \left\{ \left(2, \frac{0}{2}\right), \left(1, \frac{-4}{1}\right), \left(0, \frac{2}{0}\right) \right\}$$

$$\text{ب)} \left\{ \left(2, \frac{\sqrt{5}}{2}\right), \left(1, \frac{\sqrt{1}}{1}\right), \left(0, \frac{3}{0}\right) \right\} \rightarrow \left\{ \left(1, \frac{\sqrt{1}}{1}\right), \left(0, \frac{3}{0}\right) \right\}$$

لم تعریف نشده

$$\text{الف)} f(x) = \{(2,2), (3,1), (-5,4), (1,-4)\}$$

-9

$$\text{ب)} f(x)+1 = \{(2,3), (3,5), (-5,5), (1,-3)\}$$

$$\text{ج)} 2f^2(x)+1 = \{(2,4), (3,49), (-5,13), (1,13)\}$$

$$\text{د)} f(2x) = \left\{ \left(1,1\right), \left(\frac{3}{2},2\right), \left(-\frac{5}{2},2\right), \left(\frac{1}{2},-2\right) \right\}$$

$$\text{الف)} f-g = \{(2,2), (3,2)\}$$

-10

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