

1

$y = \sqrt{x f(x)} = ?$
 $x f(x) \geq 0$
 $D_f = [-4, \infty)$

2

داستان یوسف شامل ۵۴۰۰ صبح می باشد
 $y = \sqrt{\frac{-x}{f(x)}}$
 $\frac{-x}{f(x)} \geq 0 \rightarrow f(x) \neq 0$
 $D_f = [-4, 0]$

3

$f(x) = \begin{cases} x - \sqrt{x+4} & x \geq 3 \\ x+3 & x \leq 3 \end{cases}$
 $f(5) = 5 - 3 = 2$
 $f(2) = 2 + 3 = 5$
 $f(1) = 1 + 3 = 4$
 $f(0) = 0 - 3 = -3$

$\underbrace{f(f(5))}_5 + \underbrace{f(f(1))}_4 = ? \rightarrow 9$
 سؤال ۴

4

$f(x) - 2f(2) = x^2 - 4x + 4 \quad f(-2) = ?$
 $f(2) - 2f(2) = 4 \rightarrow -f(2) = 4 \Rightarrow f(2) = -4$
 $f(-2) + 4 = 4 + 4 + 4 \Rightarrow f(-2) = 10$
 سؤال ۳

5

$f(x) = ax^2 - bx + 2$
 $f(n-1) - f(n) = 4n+2$
 $a-b = ?$
 $1 - (-3) = 4$
 $f(n) = (n-1)(n-2)$
 $-x \begin{cases} 1a - 3x + 2 \\ 4a - 3x + 2 \end{cases} \Rightarrow \begin{cases} -a + 3 = -2 \\ 4a - 3 + 2 = 0 \end{cases}$
 $2a = 2 \Rightarrow a = 1$

$f(x) = \frac{x^3 + 4x + 1}{x^3 + 4x + 4}$ $f(\sqrt{3}-1) = ?$ $f(\sqrt{3}-1) = \frac{(\sqrt{3}-1)^3 + 4(\sqrt{3}-1) + 1}{(\sqrt{3}-1)^3 + 4(\sqrt{3}-1) + 4} \Rightarrow \frac{(\sqrt{3}-1+1)^3 + 1}{(\sqrt{3}-1+1)^3 + 4} = \frac{(\sqrt{3})^3 + 1}{(\sqrt{3})^3 + 4} = \frac{3+1}{3+4} = \frac{4}{7}$	6
$f(x - \frac{1}{x}) = \frac{x^4 + 1}{x^2}$ $f(-3) = ?$ $f(x) = \frac{x^4 + 1}{x^2} + \frac{1}{x} \Rightarrow f(x) = \frac{x^4 + x + 1}{x^2} \Rightarrow f(-3) = \frac{(-3)^4 + (-3) + 1}{(-3)^2} = \frac{81 - 3 + 1}{9} = \frac{79}{9}$	7
$f(x) = \{(x, 0), (1, -4), (0, 2), (7, 1)\}$ $g(x) = \sqrt{9 - x^2} \quad 9 - x^2 \geq 0 \Rightarrow x^2 \leq 9 \Rightarrow x \in [-3, 3]$ الف) $\frac{f}{g} = \{(0, \frac{2}{\sqrt{9}}), (1, \frac{-4}{\sqrt{8}}), (2, \frac{0}{\sqrt{5}})\}$ ب) $\frac{g}{f} = \{(0, \frac{\sqrt{9}}{2}), (1, \frac{\sqrt{8}}{-4}), (2, \frac{\sqrt{5}}{0})\}$ تعريف نسبه	8
$f(x) = \{(x, 1), (3, 4), (-5, 2), (1, -2)\}$ الف) $4f(x) = \{(x, 4), (3, 16), (-5, 8), (1, -8)\}$ ب) $f(x) + 1 = \{(x, 2), (3, 5), (-5, 3), (1, -1)\}$ ج) $3f^2(x) + 1 = \{(x, 4), (3, 49), (-5, 13), (1, 13)\}$	
$f(x) = \{(x, 3), (7, 4), (1, 4), (3, 1), (5, 2)\}$ $g(x) = \{(1, 0), (3, 1), (-1, 4), (-2, 3), (3, -1)\}$ الف) $f - g = \{(1, 4), (2, 2), (3, 2)\}$ ب) $\frac{f}{g} = \{(1, \frac{4}{0}), (2, 4), (3, -2)\}$ تعريف نسبه	10