

$f(x) = (1/2)^{x-2} - 1$ $1/2 - 1 \neq 0 \Rightarrow 1/2 = 1 \Rightarrow x = 2$ $x > 2 \rightarrow f(x) < 0$
 $x < 2 \Rightarrow f(x) > 0$
 $x + 1 > 2 \rightarrow x > 1 \rightarrow f(x) < 0$
 $x + 1 \leq 2 \Rightarrow x \leq 1 \rightarrow f(x) \geq 0$ (I)
 $D_f = [0, 1]$

$-x + 1 | -x + 2 | \rightarrow \frac{2}{+b}$
 $x > 2 \Rightarrow -x + x - 2 \geq 0$ خط غلط (S)
 $x \leq 2 \Rightarrow -2x + 2 \geq 0 \rightarrow x \leq 1 \rightarrow D_f = (-\infty, 1]$

$x - 1 \geq 0$
 $f(x)$

	-5	-4	1	2	3
$x-1$	-	-	-	+	+
$f(x)$	X	+	-	+	X
	X	-	+	+	X

 $D_f = (-4, 1] \cup (2, 3)$

$9x^4 - 7x^2 - 11x - 3 = (3x^2 - x - 3)(3x^2 + x + 7)$
 $\sqrt{-(a+b)} = \sqrt{-(-1)} \Rightarrow 2$ قبول
 $\sqrt{-(a+b)} = \sqrt{-(2)} \Rightarrow$ غیر قبول

$f(x) - f(4/x) \geq 0 \Rightarrow f(x) \geq f(4/x)$ $x^3 + x \geq 64/x^3 + 4/x$
 $x^3 + x \geq \frac{64 + 4x^2}{x^3} \Rightarrow x^3 + x - \frac{64}{x^3} - \frac{4}{x} \geq 0$
 $x^6 + x^4 - 64 - 4x^2 \geq 0$
 $x^6 + x^4 - 64 - 4x^2 = (x-2)(x+2)(x^4 + 5x^2 + 16)$
 $x^4 + 5x^2 + 16 = 25 - 4x^2 + 16 = 25 - 16 < 0$
 $D_f = [-2, 0) \cup [2, +\infty)$

$$f(x^3+x) = 2x^2-1 \quad x=2 \rightarrow f(10) = 2 \times 4 - 1 = 7$$

$$x(x^2+1) = 10 \rightarrow x = 2$$

$$x^3+x=2 \rightarrow x^3+x-2=0 \quad (x^2+x+2)(x-1)=0$$

$$x^3+x+2 \overline{) x-1}$$

$$x=1 \quad f(2) = 7$$

$$f(2) + f(10) = 7 + 7 = 14$$

$$f(x) = x^3 - 6x^2 + 12x \Rightarrow x^3 - 6x^2 + 12x - 8 + 8 = (x-2)^3 + 8$$

$$g(x) = x^3 + 9x^2 + 27x \Rightarrow x^3 + 3 \times 3x^2 + 3 \times 9x + 27 - 27 = (x+3)^3 - 27$$

$$\frac{g(\sqrt[3]{7}-3)}{f(\sqrt[3]{2}+2)} = \frac{(\sqrt[3]{7}-3+3)^3 - 27}{(\sqrt[3]{2}+2)^3 + 8} = \frac{-20}{10} = -2$$

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

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

$$|\sqrt{x-4}+2| + |\sqrt{x-4}-2| = a + b\sqrt{x+c} \quad \frac{a+b}{c} = \frac{2+2}{-4} = -\frac{1}{2}$$

$$\sqrt{x-4}+2 + \sqrt{x-4}-2 = a + b\sqrt{x+c} = 2\sqrt{x-4} = a + b\sqrt{x+c} \Rightarrow a=0 \quad b=2 \quad c=-4$$

$$\frac{g}{f} = \left\{ (2, -1/4), (1, 0), (3, 1/4), (0, 6) \right\}$$

$$f(2) = \frac{4}{4-8+3} = -4 \quad f(3) = \frac{5}{9-9} = \frac{5}{0} \rightarrow \text{تعریف نشده}$$

$$f(1) = \frac{3}{0} = \text{تعریف نشده} \quad f(0) = \frac{2}{3}$$

$$F(2x) = \left\{ (1, 2), (3/2, -1), (2, 2), (-1/2, 6) \right\}$$

$$F(x^2) = \left\{ (\sqrt{1}, 2), (\sqrt{3}, -1), (2, 2), (\sqrt{-1}, 6) \right\} \rightarrow \left\{ (1, 2), (-1, 2), (\sqrt{3}, -1) \right\}$$

$$2g^2(x)+1 = \left\{ (2, 19), (7, 3), (3, 9), (-7, 1) \right\}$$

$$\frac{2f}{g} = \left\{ (7, -4), (3, -1), (1, 0) \right\}$$