

$f_{(a)} = (a+1)(v)$ $f_{(a)} = va + v$ $f_{(-v)} = va + v(-v)$ $f_{(v)} = va - v$ $v(va+v) = va^2 - v^2 + a$ $14a + 14 = 14a - 4$ $10a = -18$ $a = \frac{-18}{10} = \boxed{\frac{-9}{5}}$	1
$(2-\sqrt{3})(2+\sqrt{3}) = 4-3=1$ $a = 2+\sqrt{3} \quad \frac{1}{a} = 2-\sqrt{3}$ $(\sqrt{a} + \frac{1}{\sqrt{a}})^2 = a + \frac{1}{a} + 2 \rightarrow a + \frac{1}{a} = (2+\sqrt{3}) + (2-\sqrt{3}) = 4$ $(\sqrt{a} + \frac{1}{\sqrt{a}})^2 = 4 \quad f(a)\sqrt{4} + 2 \quad \sqrt{4} + 2 + \sqrt{4} + 2 = \boxed{2\sqrt{4} + 4}$ $\sqrt{a} + \frac{1}{\sqrt{a}} = \sqrt{4}$ $f(2-\sqrt{3}) = f(2+\sqrt{3}) = \sqrt{4} + 2$	2
$x \rightarrow -x \quad v f_{(a)} - v f_{(-a)} = f_{(a)}^2 - a$ $v f_{(-a)} - v f_{(-a)} = f_{(-a)}^2 - a$ $x \int v f_{(-a)} - v f_{(a)} = f_{(a)}^2 + a$ $\int x^2 - v f_{(-a)} + v f_{(a)} = f_{(a)}^2 + a$ $-a f_{(a)} = f_{(a)}^2 + a \rightarrow f_{(a)} = \frac{f_{(a)}^2 + a}{-a} = \frac{-f_{(a)}^2}{a} + \frac{a}{a}$ $\boxed{f_{(a)} = -f_{(a)}^2 - \frac{a}{a}}$	3
$a+2=0$ $a=-2 \rightarrow 0 \times f_{(-2)} - 3(-2) \times f_{(0)} = 19 + 2m + 3m - 1$ $+4f_{(0)} = 5m + 18 \rightarrow f_{(0)} = \frac{5m+18}{4}$ $a=0 \rightarrow v \times f_{(0)} - 3(0)(f_{(v)}) = 3m - 1$ $v f_{(0)} = 3m - 1 \rightarrow f_{(0)} = \frac{3m-1}{v}$ $\frac{5m+18}{4} = \frac{3m-1}{2}$ $m = \frac{17}{5}$ $v f_{(0)} = 17/5$ $\boxed{f_{(0)} = 17/10}$	4
$a=-1$ $f_{(-1)} + f_{(-1)} = \frac{3(1) + 12 + 3}{-1}$ $v f_{(-1)} = -18$ $\boxed{f_{(-1)} = -9}$	5

$\left(\frac{f+g}{f-g}\right)(3) = \frac{1^3+3}{3^3-3} = \frac{4}{24} \rightarrow 0 = \textcircled{2}$ $\left(\frac{f+g}{f-g}\right)(1) = \frac{1^3+1}{1^3-1} = \textcircled{3} \textcircled{\text{الف}}$ $\left. \begin{matrix} f(0) = 0 \\ g(-1) = 1 \end{matrix} \right\} = 0 \textcircled{8}$ جواب سوال 9، 11 است و می باشد به این ترتیب 11	6
$f(x) = \alpha \sqrt{x} \quad \alpha \geq 0 \rightarrow D_f = [0 + \infty)$ $g(x) = \sqrt{\alpha x^3} \quad \alpha \geq 0 \rightarrow D_g = [0 + \infty)$ ↓ $ \alpha \sqrt{x} \rightarrow \alpha \sqrt{x} \quad \checkmark$ صورت منفی دو تابع مساوی هستند	7
$g(x) = \sqrt{x- x } \quad x- x \begin{matrix} \alpha > 0 \rightarrow x- x = 0 \\ \alpha < 0 \rightarrow x-(-x) = 2x \end{matrix} \rightarrow D_g = [0 + \infty)$ برای اینکه علامتی شدن است $f(x) = [\sqrt{x} - \lfloor \sqrt{x} \rfloor] \quad [\sqrt{x}] - \lfloor \sqrt{x} \rfloor = 0 \quad \alpha \geq 0 \quad D_f = [0 + \infty)$ دو تابع مساوی هستند	8
$f(x) = (\alpha-1) \sqrt{1-x} \quad \begin{matrix} 1-x > 0 \\ \alpha \leq 1 \end{matrix} \quad \begin{matrix} 1-x \geq 0 \\ \alpha \leq 1 \end{matrix}$ $g(x) = -\sqrt{(1-x)^3} = -\sqrt{(1-x)^2(1-x)} = - 1-x \sqrt{1-x} = (\alpha-1) \sqrt{1-x}$ همواره مثبت دو تابع مساوی هستند	9
$f(3\alpha-1) = g_{\alpha}$ $g_{\alpha} = \left\{ \left(1, \frac{1}{3}\right), (0, 0), \left(\frac{1}{3}, 0\right), \left(\frac{1}{3}, 2\right), \left(\frac{1}{3}, 0\right) \right\}$ همه اینها $h = \{ (0, 0), (2, 1), (3, -1) \}$ $h_2 = f(2) = 1$ $f(0) = h(0) = 0$ $f(3) = h(3) = -1$ 3\alpha-1 = 3 \quad \alpha = \frac{4}{3} \textcircled{\text{الف}} 3\alpha-1 = 2 \quad \alpha = 1 3\alpha-1 = -1 \quad \alpha = 0 3\alpha-1 = 0 \quad \alpha = \frac{1}{3} 3\alpha-1 = 2 \quad \alpha = -\frac{1}{3}	10