

$$\varphi > 1 \Rightarrow 2f(\varphi) = (\varphi+1)(\varphi) = \varphi\varphi + \varphi$$

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$$-2 \leq 1 \Rightarrow f(-2) = 3a - 4$$

$$a = -\frac{9}{5}$$

$$2(\varphi\varphi + \varphi) = 3a - 4 + a$$

$$14a + 14 = 4a - 4$$

$$10a = -18$$

$$a = -\frac{9}{5}$$

✓

$$(2-\sqrt{3})(2+\sqrt{3}) = 1$$

$$\frac{1}{\sqrt{2-\sqrt{3}}} = \sqrt{2+\sqrt{3}}$$

$$\sqrt{2-\sqrt{3}} + \sqrt{2+\sqrt{3}} = \sqrt{6}$$

$$f(n) = \sqrt{n} + \frac{1}{\sqrt{n}} + 2$$

$$f(2-\sqrt{3}) + f(2+\sqrt{3}) = \boxed{\sqrt{6} + 4}$$

✓

$$2f(n) - 3f(-n) = 4n^2 - n$$

-n را به جای n جایگزین می کنیم

$$2f(-n) - 3f(n) = 4n^2 + n$$

$$\begin{aligned} 2f(n) - 3f(n) &= 4n^2 - n \quad \times 2 \\ -3f(n) + 2f(-n) &= 4n^2 + n \quad \times 2 \end{aligned}$$

$$f(n) = -\frac{4n^2 - 2n}{5}$$

$$-5f(n) = 4n^2 + n$$

$$4f(n) - 5f(-n) = 12n^2 - 2n$$

$$-9f(n) + f(-n) = 12n^2 + 2n$$

$$n=0 \quad 2f(0) = 3m-1 \quad f(0) = \frac{3m-1}{2}$$

$$n=-2 \quad 9f(0) = 10 + 6m$$

$$9 \times \frac{3m-1}{2} = 10 + 6m$$

$$3(3m-1) = 10 + 6m$$

$$9m-3 = 10+6m \Rightarrow 3m=13 \Rightarrow m = \frac{13}{3}$$

$$f(0) = \frac{3 \times \frac{13}{3} - 1}{2} = \boxed{\frac{10}{2}} = 5$$

$$f(n) = an + b$$

$$f(n) + f\left(\frac{1}{n}\right) = an + b + \frac{a}{n} + b = an + 2b + \frac{a}{n}$$

$$\frac{3n^2 - 12n + 3}{n} = 3n - 12 + \frac{3}{n}$$

$$a=3 \quad 2b=-12$$

$$b=-6$$

$$f(n) = 3n - 6$$

$$f(-1) = 3(-1) - 6 = \boxed{-9}$$

