

$$f\left(\sin \frac{\pi}{4} + \cos \frac{\pi}{4}\right)$$

$$\downarrow \quad \downarrow$$

$$\frac{\sqrt{2}}{2} + 1 \rightarrow \frac{1+\sqrt{2}}{2}$$

$$f\left(\frac{1+\sqrt{2}}{2}\right) = 2\left(\frac{1+\sqrt{2}}{2}\right) - f\left(\frac{1+\sqrt{2}}{2}\right) = \frac{1+\sqrt{2}}{2} - \frac{1+\sqrt{2}}{2} = \frac{1+\sqrt{2}-1-\sqrt{2}}{2} = \frac{0}{2} = 0$$

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$$f\left(\frac{a+1}{a-1}\right) = a \rightarrow f\left(\frac{a+1}{a-1}\right) = \frac{a+1+a-1}{a-1} = \frac{2a}{a-1} = a \rightarrow \mathbb{R}$$

$$- \boxed{a \neq 1} \rightarrow \text{مخرج صفر}$$

$$- f(a) \rightarrow \frac{a+1}{a-1} \neq 1 \rightarrow a+1 \neq a-1 \leftarrow \mathbb{R} \rightarrow D_f = \mathbb{R} - \{1\}$$

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$$g(a) = \sqrt{a^2 - 1} \rightarrow f(\sqrt{a^2 - 1}) = (\sqrt{a^2 - 1})^2 - f(\sqrt{a^2 - 1}) = |a^2 - 1| - \sqrt{a^2 - 1} = -f$$

$$t^2 - ft + f = 0$$

$$(t - f)(t - 1) = 0 \quad t = f$$

$$\sqrt{a^2 - 1} = f$$

$$|a^2 - 1| = f^2$$

$$a^2 = d \rightarrow a = \pm \sqrt{d}$$

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$$f(-3) \rightarrow x + y = -3 \rightarrow x = -4 \rightarrow 3(-4) + 3 + 4 = 0$$

$$f(4) \rightarrow x + y = 4 \rightarrow x = 1 \rightarrow 1 - 4 + 4 = 1$$

$$\rightarrow 2 \times 0 = 0$$

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$$t \cos^2 x + 2 \cos x = \frac{1}{4} \rightarrow 16 \cos^2 x + 16 \cos x - 4 = 0 \rightarrow 4t^2 + 16t - 4 = 0$$

$$t = \cos = \frac{1}{4} \rightarrow 4^\circ, 96^\circ$$

$$t = \cos = -\frac{1}{4} \rightarrow 104^\circ, 256^\circ$$

$$\Delta = 160 - 4(16)(-4) = 160 + 256 = 416$$

$$t = \frac{-16 \pm \sqrt{416}}{8} \rightarrow \frac{-16 + 16}{8} = 0$$

$$\rightarrow \frac{-16 - 16}{8} = -4$$

$$1 + \tan^2 x = \frac{1}{\cos^2 x} \rightarrow 1 + \tan^2 x = \frac{1}{\left(\frac{1}{4}\right)^2} = 16 \Rightarrow \tan^2 x = 15$$

$$\rightarrow f(15) = 15$$

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