

پلا آئین

$$f(x) \geq 0 \quad \begin{array}{c} -5 \quad 0 \quad 2 \quad 5 \\ - \quad + \quad - \quad + \quad - \end{array} \quad D_f = [-5, 0] \cup [2, 5]$$

✓

$$\frac{-x}{f(x)} \geq 0 \quad f(x) \neq 0 \quad \begin{array}{c} -3 \quad 0 \quad 2 \\ - \quad + \quad - \end{array}$$

$$D_f = (-3, 0) \cup (0, 2)$$

✓

$$f(2) - 2f(2) = 4 - 9 + 2 \Rightarrow -f(2) = 2 \Rightarrow f(2) = -2$$

$$f(-2) - 2(-2) = 4 + 4 + 2 \Rightarrow f(-2) = 1$$

✓

$$f(1) = 2 + 3 = 5 \Rightarrow f(5) = 5 - \sqrt{9} \Rightarrow f(5) = 2$$

$$f(2) = 2 \times 2 + v \Rightarrow v + 2 = 9$$

✓

$$f(x-1) = a(x-1)^2 - b(x-1) + 2$$

✓

$$f(x-1) - f(x) = -2ax + a + b \Rightarrow 9x = -2ax \quad 5$$

$$9 = -2a \Rightarrow a = -\frac{9}{2}$$

$$a + b = 2 \Rightarrow -\frac{9}{2} + b = 2 \Rightarrow b = \frac{13}{2} \quad a - b = -\frac{9}{2} - \frac{13}{2} = -11$$

$$f(x) = x^2 - x + 1 = 1$$

$$f(-1) = 1 + 1 + 1 = 3$$

$$f(2) = 4 - 2 + 1 = 3$$

$$\frac{f(1) + 0}{1} = 1$$

(P) ✓

$$f(4) = 16 - 4 + 1 = 13$$

$$f(-2) = 4 - (-2) + 1 = 7$$

$$f(2) = 4 - 2 + 1 = 3$$

$$\left. \begin{array}{l} f(4) = 13 \\ f(-2) = 7 \\ f(2) = 3 \end{array} \right\} \frac{f(13) - f(4)}{13 - 4} = \frac{13}{9}$$

(P) ✓

$$\frac{f(f(4)) - f(f(2))}{f(1) - 1}$$

$$= \frac{9 - 4}{1} = \frac{5}{1} = 5$$

(P) ✓

$$f(\sqrt{x} - 1) \Rightarrow \frac{(\sqrt{x} - 1)^2 + f(\sqrt{x} - 1) + 9}{(\sqrt{x} - 1)^2 + f(\sqrt{x} - 1) + 6} = \frac{1}{x} = 1$$

$$f(2) = \frac{4 + 1 + 9}{4 + 1 + 6} = \frac{14}{11}$$

(P) ✓

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

$$(f(\sqrt{x}))^2 = (x + \frac{1}{x})^2 = x^2 + 2 + \frac{1}{x^2} \Rightarrow$$

$$(f(\sqrt{x}))^2 - f(x) = x^2 + 2 + \frac{1}{x^2} - (x^2 + \frac{1}{x^2}) = 2$$

(P) ✓