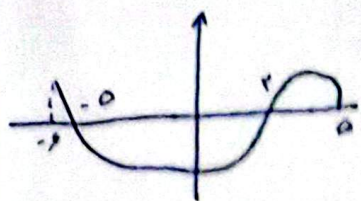


تکلیف ✓

یا رسا صادق

19, 175

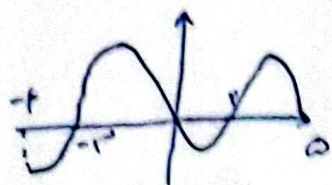


$$y = \sqrt{x}f(x)$$

$$x = +, y = - \frac{1}{2} \quad x = +, y = +$$

(2) ✓

$$[-5, 0] \cup [2, 5]$$



$$y = -\frac{x}{f(x)}$$

$$x = +, y = - \frac{1}{2} \quad y = +, x = -$$

(2) ✓

صفر نمی تواند باشد

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

$$f(x) - 2f(2) = x^2 - 2x + 4$$

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

$$f(-2) - 2f(2) = (-2)^2 + 4 + 4 \Rightarrow f(-2) + 4 = 12$$

$$-f(2) = 2$$

$$f(2) = -2$$

$$f(-2) = 10$$

(2) ✓

$$f(f(5)) + f(f(1))$$

$$f(x) = \begin{cases} x - \sqrt{x} + 1 & x \geq 1 \\ x + 1 & x < 1 \end{cases}$$

$$f(1) = 1 + 1 = 2$$

$$f(0) = 2$$

$$f(0) = 0 - \sqrt{0+1} = -1$$

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

$$1 + 2 = 3$$

(2) ✓

$$f(x) = ax^2 - bx + 2$$

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

$$f(x) = ax^2 - bx + 2 \Rightarrow f(x-1) = a(x-1)^2 - b(x-1) + 2$$

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

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

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

$$-2ax + a + b = 2x + 2$$

$$a + b = 2 \rightarrow -2 + b = 2$$

$$a - b = -1$$

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

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

$$\frac{2(1) + 0}{1} = 2$$

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

$$f'(x) = [f(x)]' = (-1)' = 1$$

(2) ✓

$$f(x) = \begin{cases} x^2 + 1 & x \geq 1 \\ x^2 & x < 1 \end{cases}$$

$$f(1) = 1^2 + 1 = 2 \quad f(2) = 2^2 + 1 = 5$$

$$\frac{f(2) - f(1)}{f(2)} = \frac{5 - 2}{5} = \frac{3}{5}$$

1, 1, 0

✓

$$f = \{(1, 2), (2, 5), (3, 1), (1, 4)\} \quad f(1) = 1 \quad f(1) = 4$$

$$f(2) = 2$$

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

2 ✓

$$f(x) = \frac{x^2 + fx + 9}{x^2 + fx + 6}$$

$$f(f(\sqrt{2}-1))$$

$$x = \sqrt{2} - 1$$

$$x + 1 = \sqrt{2}$$

$$\sqrt{x^2 + fx + 6} = (x+1)^2 + 6 = 7 + 6 = 13$$

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

$$x^2 + fx + f + 1 = (x+1)^2 + 1 = 2 + 1 = 3$$

$$f(2) = \frac{2^2 + 2 + 9}{2^2 + 2 + 6} = \frac{17}{10}$$

2 ✓

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

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

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

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