

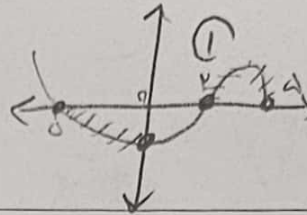
۲. (تفصیلی)

$$x f(x) \geq 0$$

یا یکی صفر
یا هر دو مثبت
یا هر دو منفی

✓ ۲

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

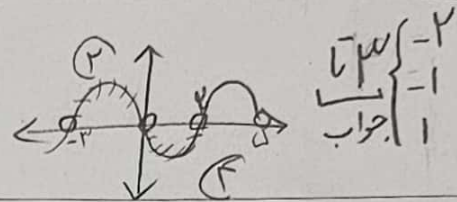


$$\frac{-x}{f(x)} \geq 0$$

نباید صفر باشد زیرا تعریف ندارد $f(x)$
یکی مثبت و یکی منفی زیرا باید کسر
مثبت شود (ناحیه ۱ و ۴)

✓ ۳

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



$$f(x) - 2f(2) = x^2 - 3x + 4 \quad \text{①} \quad f(2) \rightarrow f(2) - 2f(2) = 4 - 6 + 4 = 2$$

$$f(-2) - 2f(-2) = (-2)^2 - 3(-2) + 4 = 4 + 6 + 4 = 14$$

$$-f(2) = 2 \Rightarrow f(2) = -2$$

$$f(-2) = 10$$

جواب

✓ ۴

$$\frac{f(f(4))}{7} + \frac{f(f(1))}{2}$$

$$\Rightarrow f(1) = 2(1) + 3 = 5$$

$$\Rightarrow f(4) = 4 - \sqrt{4+4} = 2$$

$$\Rightarrow f(5) = 2$$

$$= 9$$

جواب

$$\Rightarrow f(2) = 2(2) + 3 = 7$$

✓ ۵

$$f(x-1) - f(x) = 6x + 2 \quad f(x-1) = a(x^2 - 2x + 1 - 1) - b(x-1) + 2$$

$$= ax^2 - 2ax + a - bx + b + 2$$

$$\Rightarrow (ax^2 - 2ax + a - bx + b + 2) - (ax^2 - bx + 2) = 6x + 2$$

$$ax^2 - 2ax + a - bx + b + 2 - ax^2 + bx - 2 = 6x + 2 \quad a - b = (-3)(5) = -17$$

$$-2ax + a + b = 6x + 2 \Rightarrow -2ax = 6x \Rightarrow a = -3 \Rightarrow -3 + b = 2 \Rightarrow b = 5$$

✓ ۶

$$\frac{2(3^2 - 3 \times 2 + 1) + (-1^2 - 3(-1) + 1)}{(3^2 - 3 \times 2 + 1)^2} = \frac{2 + 4}{1} = \underline{\underline{6}} \text{ : جواب}$$

6

(2) ✓

$$\frac{3(3 \times 2 + 1) - 2(-2)^2}{2 \times 3 + 1} = \frac{39 - 8}{7} = \underline{\underline{\frac{31}{7}}} \text{ : جواب}$$

7

(2) ✓

$$\frac{f(\overbrace{f(1)}^1) - f(\overbrace{f(2)}^2)}{\overbrace{f(1) - 2}^1} = \frac{0}{1} = \underline{\underline{0}} \text{ : جواب}$$

8

(2) ✓

$$\frac{(\sqrt{3}-2)^2 + 4(\sqrt{3}-2) + 9}{(\sqrt{3}-2)^2 + 4(\sqrt{3}-2) + 5} = \frac{3+4-4\sqrt{3}+4\sqrt{3}-1+9}{3+4-4\sqrt{3}+4\sqrt{3}-1+5} = \frac{16}{16} = \underline{\underline{1}} \text{ (2)}$$

9

$$\frac{2^2 + 2 \times 2 + 9}{2^2 + 2 \times 2 + 5} = \frac{21}{17} \text{ : جواب}$$

(2) ✓

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

(2) ✓

$$\Rightarrow (x + \frac{1}{x})^2 - (x^2 + \frac{1}{x^2}) = x^2 + \frac{1}{x^2} + (2 \times x \times \frac{1}{x}) - x^2 - \frac{1}{x^2} = \underline{\underline{2}} \text{ : جواب}$$

10