

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

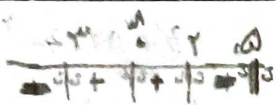
$$x=0$$

$$f(x)=0 \rightarrow x=-5, 2, 5$$



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

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



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$$D_f = (-3, 2) \cap \mathbb{Z} = \{-2, -1, 0, 1\}$$

$$x=0$$

$$f(x)=0 \rightarrow x=-3, 0, 2, 5$$

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

$$x = -2$$

$$f(-2) - 2 \times (-2) = 14$$

$$\text{if } x=2 \rightarrow f(2) - 2f(2) = 2$$

$$f(-2) + 4 = 14$$

$$f(-2) = 10$$

$$-f(2) = 2$$

$$f(2) = -2$$

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

$$= 9$$

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

$$f(5) = 5 - \sqrt{5+4} = 2$$

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

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

$$f(x-1) - f(x) = ax^2 - 2ax + a - b(x-1) + 2 - (ax^2 - 6x + 2) = 4x + 2$$

$$-2ax + (a+b) = 4x + 2$$

$$-2ax = 4x$$

$$a = -3$$

$$b = 5$$

$$a-b = -3-5 = -8$$

$$f(x) = \frac{(x+2)^2 + 1}{(x+2)^2 + 3}$$

$$f(\sqrt{3}-2) = \frac{(\sqrt{3}-2+2)^2 + 1}{(\sqrt{3}-2+2)^2 + 3} = \frac{1}{4} = \frac{1}{4}$$

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

$$\text{if } x - \frac{1}{x} = -3$$

$$(x - \frac{1}{x})^2 = 9$$

$$x^2 - 2 + \frac{1}{x^2} = 9$$

$$x^2 + \frac{1}{x^2} = 11$$

$$f(-3) = 11$$

$$\text{الف) } \frac{f}{g} = \left\{ (2, 0), (0, \frac{3}{4}), (1, \frac{4}{\sqrt{2}}) \right\}$$

$$\text{ب) } \frac{g}{f} = \left\{ (2, \frac{\sqrt{2}}{4}), (1, \frac{\sqrt{2}}{4}), (0, \frac{3}{4}) \right\} \rightarrow \left\{ (1, \frac{\sqrt{2}}{4}), (0, \frac{3}{4}) \right\}$$

$$D = \{x \mid x = 1\}$$

$$\text{الف) } 2f(x) = \left\{ (2, 2), (3, 1), (-5, 3), (1, -4) \right\}$$

$$\text{ب) } f(x) + 1 = \left\{ (2, 3), (3, 5), (-5, 4), (1, -3) \right\}$$

$$\text{ج) } 3f(x) + 1 = \left\{ (2, 7), (3, 4), (-5, 10), (1, -11) \right\}$$

$$\text{د) } f(2x) = \left\{ (1, 1), (2, \frac{3}{4}), (-2, \frac{3}{4}), (3, -2) \right\}$$

$$\text{الف) } f - g = \left\{ (2, 2), (1, 4), (3, 2) \right\}$$

$$\text{ب) } \frac{2f}{g} = \left\{ (2, 4), (3, -2) \right\}$$

$$D = [2k\pi + \frac{\pi}{4}, 2k\pi + \frac{3\pi}{4}]$$