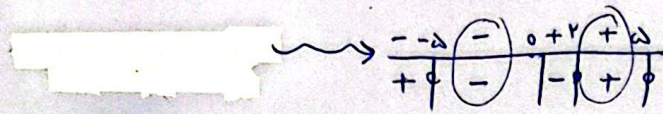


یعنی باید $f(x)$ و x هم علامت باشند $\rightarrow x f(x) \geq 0 \rightarrow y = \sqrt{x f(x)}$

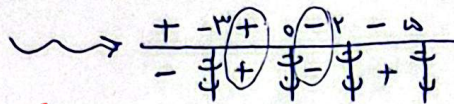


(۲) ✓

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

۱

یعنی باید $f(x)$ و $\frac{-x}{f(x)}$ هم علامت باشند $\rightarrow \frac{-x}{f(x)} \geq 0, f(x) \neq 0$



(۲) ✓

$$D_f = (-3, 0) \cup (0, 2) \xrightarrow{\text{اعداد صحیح}} (-2, -1, 1) \rightarrow \boxed{-2, -1, 1}$$

۲

$$f(x) - 2f(2) = x^2 - 2x + 4 \xrightarrow{x=2} f(2) - 2f(2) = 2^2 - 2 \cdot 2 + 4 = 4 - 4 + 4 = 4$$

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

(۲) ✓

$$f(-2) - 2(-2) = \frac{f}{x} \cdot \frac{-2}{f} + 4$$

$$\rightarrow f(-2) + 4 = 4 \rightarrow \boxed{f(-2) = 0}$$

۳

$$f(x) = \begin{cases} x - \sqrt{x+3} & x > 3 \\ 2x+3 & x \leq 3 \end{cases}$$

$$f(5) = 5 - \sqrt{5+3} = 2 \rightarrow f(2) = 2 \cdot 2 + 3 = 7$$

$$f(1) = 2 \cdot 1 + 3 = 5 \rightarrow f(5) = 2$$

(۲) ✓

$$5+2 = \boxed{7}$$

۴

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

$$\rightarrow a(x^2 - 2x + 1) - bx + b + 2 - ax^2 + bx - 2 = 4x + 2$$

$$\rightarrow \cancel{ax^2} - 2ax + \boxed{a+b} - \cancel{bx} = \boxed{4x+2}$$

$$\begin{cases} -2ax = 4x \rightarrow a = -2 \\ a+b = 2 \rightarrow -2+b = 2 \rightarrow b = 4 \end{cases}$$

(۲) ✓

$$\left. \begin{cases} -2ax = 4x \rightarrow a = -2 \\ a+b = 2 \rightarrow -2+b = 2 \rightarrow b = 4 \end{cases} \right\} a-b = -2-4 = \boxed{-6}$$

۵

$$\frac{r(r^2 - r^2 \alpha + 1) + ((-1)^r - r^2(-1) + 1)}{(r^2 - r^2(r+1))^r} = \frac{r \times 1 + 1 - (-r^2) + 1}{(r^2 - r^2 + 1)^r} = \frac{r}{1} = \textcircled{V}$$

Ⓟ ✓

$$\frac{r(\frac{1}{r^2}r + 1) - r(-1)^r}{(r^2r + 1)} = \frac{r \times 1 - 1}{r} = \frac{r-1}{r} = \textcircled{\frac{r-1}{r}}$$

Ⓟ ✓

$$r \rightarrow 9 / r \rightarrow 2 / r \rightarrow 1 / 1 \rightarrow 9$$

$$\frac{f(f(r)) - f(f(r))}{f(1) - r} = \frac{0}{r} = \boxed{0} \quad \textcircled{\text{P}} \quad \checkmark$$

$$f(x) = \frac{(x+r)^r + \omega}{(x+r)^r + 1} \quad // \quad x = \sqrt{r} - r \rightarrow x+r = \sqrt{r}$$

$$\rightarrow \frac{r + \omega}{r + 1} = \frac{1}{r} = r \quad \textcircled{\text{P}} \quad \checkmark \quad \rightarrow \frac{19 + \omega}{19 + 1} = \frac{r-1}{r}$$

$$\left(\left(\sqrt{x} \right)^r + \frac{1}{(\sqrt{x})^r} \right)^r - \left(x^r + \frac{1}{x^r} \right) = \cancel{x^r} + r + \frac{1}{x^r} - \cancel{x^r} - \frac{1}{x^r} = \textcircled{r}$$

Ⓟ ✓