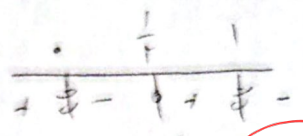


$x \neq 1, x \neq -1$

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



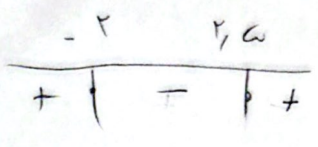
$D_f = (-\infty, 0) \cup (\frac{1}{2}, 1)$

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

$x \neq -2, -1, 0, 1$

$D_f = \mathbb{R} - \{-2, -1, 0, 1\}$

ا) $f(x) = \sqrt{\left(\left(\frac{1}{x}\right)^n - 9\right)(x^2 - 4)}$



$D_f = (-\infty, -2] \cup [2, +\infty)$

ب) $\sqrt{x-1} + \sqrt{y+1} = 2$
 $x \geq 1$ (I)

$x = \sqrt{x-1} \geq 0$

$\sqrt{x-1} \leq 2$
 $|x-1| \leq 4$

$-4 \leq x-1 \leq 4$

$-3 \leq x \leq 5$ (II)

(I) $\cap$ (II) $\Rightarrow D_f = [1, 5]$

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

$x^2 - x - 2 > 0 \Rightarrow (x-2)(x+1) > 0$

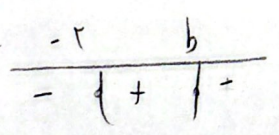
$\frac{-1}{2} < x < \frac{5}{2}$ (I)

$x^2 - 1 > 0 \Rightarrow x > 1$ or $x < -1$ (II)

معرفة مخرج

(I) $\cap$ (II) $\rightarrow D_f = (-\infty, -1) \cup (2, +\infty)$

(2) $\sqrt{x^2 + ax - 2}$
 من كبريم بار
 -2 د ب ريد باري
 من مستند



$S = b + (-2) = \frac{-a}{-1} = a$

$P = -2b = -3$

$b, \frac{5}{2} > a > b, \frac{5}{2} - \frac{1}{2} = 2$

$\frac{5}{2} - 2 = a = -\frac{1}{2}$

$g(x) = \sqrt{f(x) - x} \xrightarrow{x \geq 1} \sqrt{x^2 - 2 - x} = \sqrt{x^2 - x - 2}$

$x^2 - x - 2 > 0 \Rightarrow x > 2$ or $x < -1$ (I)

$\xrightarrow{x < 1} \sqrt{x^2 + 3 - x} = \sqrt{x^2 - x + 3}$

$x + 3 > 0 \Rightarrow x > -3$ or $x < -1$ (II)

(I) $\cup$ (II) $\rightarrow D_g = [-3, +\infty)$

$$f(n) = \begin{cases} (n+1)(n+r) & n > 1 \\ r_n + r_n & n \leq 1 \end{cases} \quad f(n) = (n+1)r, \forall n \in \mathbb{N}$$

$$rf(n) = f(-r) + n \quad 1r_n + 1r_n = r_n + r_n$$

$$1. n = -1 \quad \boxed{n = -1, 1}$$

$$f(n) = \sqrt{n} + \frac{1}{\sqrt{n}} + r$$

$$\sqrt{r-\sqrt{r}} + \frac{1}{\sqrt{r-\sqrt{r}}} + \sqrt{r+\sqrt{r}} + \frac{1}{\sqrt{r+\sqrt{r}}} + r$$

$$r(\sqrt{r-\sqrt{r}} + \sqrt{r+\sqrt{r}}) + r \quad A^2 = r-\sqrt{r} + 4\sqrt{r} + r\sqrt{1} = 7$$

$$A = \sqrt{7} \quad \boxed{2\sqrt{7} + r}$$

$$rf(n) - rf(-n) = (n^r - n) \xrightarrow{n=-n} rf(-n) - rf(n) = (n^r + n)$$

$$-1rf(n) + rf(-n) = (n^r + n) \quad f(n) = \frac{-rf(n^r + n) - r(n^r - n)}{r - r} = \frac{-r(n^r + n) - r(n^r - n)}{0} = -\frac{n^r - n}{2}$$

$$(n+r)f(n) - rf(n+r) = (n^r - rn + r_n - 1) \xrightarrow{n=r} rf(r) = r_{n-1}$$

$$\xrightarrow{n=-r} rf(r) = 1r + r_n + r_{n-1} = \omega_n + 1r$$

$$\frac{\omega_{n+1}}{r_{n-1}} = r \quad r_n - r = \omega_n + 1r$$

$$r_n = 1r \quad m = rf(\omega) - rf(\cdot) = 1r, \omega - 1r = 1r, \omega \quad f(\cdot) = 9, 2r$$

$$f(2) + f(\frac{1}{2}) = \frac{r_n^r - 1r_n + r}{n} = r_n - 1r + \frac{r}{n} = r_n - 4 + \frac{r}{n} = 4$$

$$f(t) = rt - 4 \xrightarrow{t=-1} f(-1) = -r - 4 = -9$$