

الف $\frac{x-1}{x} - \frac{x}{x-1} \geq 0 \rightarrow \frac{x^2-1}{x(x-1)} \leq 0$

$\frac{0}{2} \quad \frac{1}{2} \quad 1$

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

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$x+1 \neq 0$
 $x \neq 0$
 $x-1 \neq 0$
 $x+2 \neq 0$
 $\frac{x}{x-1} + \frac{1}{x+2} \neq 0 \rightarrow x \neq -\frac{2}{5}$

$D_F = \mathbb{R} - \{-\frac{2}{5}, -2, -1, 0\}$

الف

$\begin{cases} x-x^2-2^x \leq 0 \rightarrow x \geq 2 \\ x^2-2^x \leq 0 \rightarrow x \geq \frac{2}{2} \\ x^2-x-2^x \geq 0 \rightarrow x \leq -2 \\ x^2-2^x \geq 0 \rightarrow x \leq \frac{2}{2} \end{cases} \rightarrow D_F = [-2, \frac{2}{2}]$

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$\sqrt{x-1} + \sqrt{y+1} = 3$
 $x-1 \geq 0$
 $\sqrt{x-1} = 3 - \sqrt{y+1} \rightarrow y = 8 + \sqrt{x-1} - 4\sqrt{x-1} \rightarrow x-1 \geq 0$

$3 - \sqrt{x-1} \geq 0 \rightarrow 3 \geq \sqrt{x-1} \rightarrow x \leq 10$

$D_F = [1, 10]$

$\sqrt{x^2-1} + 1 \neq 0 \checkmark$
 $x^2-1 \geq 0 \rightarrow \mathbb{R} - (-1, 1)$
 $x^2-x-2 > 0 \rightarrow \mathbb{R} - [-1, 2]$

$D_F = (-\infty, -1) \cup (2, +\infty)$

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$\frac{a}{b} = -\frac{1}{2} \rightarrow b = -2a$
 $S = -\frac{1}{2} + b = -\frac{1}{2} \rightarrow a = -\frac{1}{2}$
 $P = -\frac{1}{2}b = -\frac{1}{2} \rightarrow b = \frac{1}{2}$

$a+b = 0$

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$\begin{cases} x \geq 1 \rightarrow x-2 \geq x \rightarrow x \geq 1 \\ x < 1, 2x+2 \geq x \rightarrow x \geq -2 \end{cases} \rightarrow D_F = [-2, +\infty)$

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$$\left. \begin{aligned} r f_{(0)} &= r^c(a+1) \\ f_{(-r)} &= r^c a + r^c \end{aligned} \right\} \rightarrow \underline{a = -1/1}$$

$$A = \sqrt{r-\sqrt{r}} + \sqrt{r+\sqrt{r}} + r^c + \underbrace{\frac{1}{\sqrt{r+\sqrt{r}}}}_{\sqrt{r+\sqrt{r}}} + \underbrace{\frac{1}{\sqrt{r-\sqrt{r}}}}_{\sqrt{r-\sqrt{r}}} = r \left(\underbrace{\sqrt{r+\sqrt{r}} + \sqrt{r-\sqrt{r}}}_C + r \right)$$

$$C = r^c + r \rightarrow C = \sqrt{r}$$

$$A = r(C+r) = \underline{r\sqrt{r} + r^c}$$

$$\left. \begin{aligned} x=x \rightarrow r f_{(x)} &= r^c x - x + r^c f_{(-x)} \\ x=-x \rightarrow r f_{(-x)} &= r^c x + x + r^c f_{(x)} \end{aligned} \right\} \rightarrow \underline{f_{(x)} = -r^c x - \frac{r^c}{x}}$$

$$x=0 \rightarrow r f_{(0)} = r^c m - 1$$

$$x=-r \rightarrow r f_{(0)} = 1r + \omega m - 1 = \omega m + r \left\{ \rightarrow \underline{f_{(0)} = \frac{r\omega}{r}} \right.$$

$$x=-1 \rightarrow f_{(-1)} = -a+b$$

$$f_{(x)} = ax + b \rightarrow ax + \frac{a}{x} + rb = \frac{r^c x^r - 1r^c x + r^c}{x} = \frac{r^c}{x} (x^r - r^c x + 1)$$

$$= \underbrace{r^c x - 1r^c}_{\frac{r^c}{a}} + \underbrace{\frac{r^c}{x}}_a$$

$$\Rightarrow -1r^c = rb$$

$$\rightarrow \boxed{b = -r^c} \text{ , } \boxed{a = r^c}$$

$$\rightarrow f_{(-1)} = -a+b = -r^c - r^c = \boxed{-9}$$