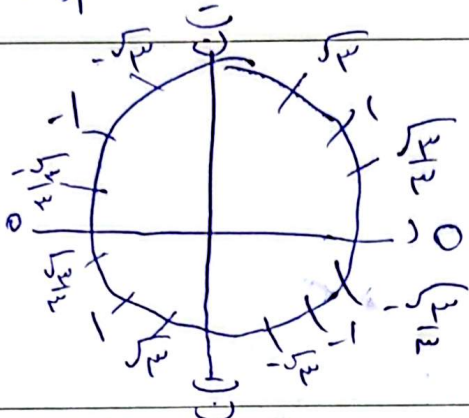




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الف) $\frac{1}{2} - 1 - 2 = -\frac{5}{2}$
 ب) $-(-\frac{\sqrt{3}}{2}) + \frac{\sqrt{3}}{2} - 3(-\frac{3\sqrt{3}}{4}) = \frac{5\sqrt{3}}{4}$
 ج) $-\frac{\sqrt{3}}{2} - \frac{\sqrt{3}}{2} + \frac{3\sqrt{3}}{2} + \frac{2\sqrt{3}}{2} = \frac{4\sqrt{3}}{2}$
 د) $(-\cos(0) + \sin(\pi/3)) - 1 + 1 = 2$

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$a^2 + 4a = 3a + 2 \Rightarrow a^2 + a + 2 = 0$ $a > 0$ $(a=1)$
 $f(1) = 1 + 4 = 5$

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$\begin{cases} a_1 > 1 \rightarrow f(a_1) = 2a_1 + 1 \\ -1 < a_1 < 1 \rightarrow f(a_1) = 2a_1 + 1 \\ a_1 < -1 \rightarrow f(a_1) = a_1 + 2a_1 \end{cases}$ $a_1 = 3$
 $-1 < a_1 < 1 \rightarrow a_1 + 1 = 2a_1 + 1 \Rightarrow a_1 = 0$
 $a_1 + 1 = 2a_1 + 1 \Rightarrow a_1 = 0$

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الف) $y = \frac{1}{a^2 - 4a} = \frac{1}{a(a-4)}$
 $\frac{1}{a(a-4)} = \frac{A}{a} + \frac{B}{a-4}$
 $1 = A(a-4) + B(a)$
 $1 = Aa - 4A + Ba$
 $1 = (A+B)a - 4A$
 $(A+B)a - 4A = 1$
 $A+B=0$
 $-4A=1 \Rightarrow A=-\frac{1}{4}$
 $B=\frac{1}{4}$
 $\frac{1}{a(a-4)} = \frac{-1/4}{a} + \frac{1/4}{a-4}$
 $\frac{1}{a(a-4)} = \frac{-1/4(a-4) + 1/4(a)}{a(a-4)}$
 $\frac{1}{a(a-4)} = \frac{-1/4a + 1 + 1/4a}{a(a-4)}$
 $\frac{1}{a(a-4)} = \frac{1}{a(a-4)}$
 $(a^2+1)(2a_1+3) \neq 0$
 $a_1^2+1 \neq 0$
 $2a_1+3 \neq 0 \Rightarrow a_1 \neq -\frac{3}{2}$
 $D_f = \mathbb{R} - \{0, 4\}$
 $D_f = \mathbb{R} - \{-\frac{3}{2}\}$

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$y = \sqrt{a^2-1} + \sqrt{a^2-r}$ $a^2-1 > 0 \rightarrow a > 1$ ① $a^2-r > 0 \rightarrow a > \sqrt{r}$ ②
 $\text{①} \cap \text{②} \rightarrow D_f = [r, +\infty)$

ب) $y = \frac{\sqrt{4-a^2}}{\sqrt{4a^2-r}}$ $4-a^2 > 0 \rightarrow a < 2$ $4a^2-r > 0 \rightarrow a > \frac{\sqrt{r}}{2}$
 $D_f = (\frac{1}{\sqrt{r}}, 2]$

$y = \sqrt{4a^2-a} + \sqrt{b-a}$ $b-a > 0 \rightarrow b > a$ $4a^2-a > 0 \rightarrow a > \frac{1}{4}$ $a = \frac{1}{4}$
 $\frac{b}{a} = \frac{4}{1} = 4$

ا) $y = \sqrt{\frac{a^2-a-4}{a^2-13a+42}}$ $= \sqrt{\frac{(a-4)(a+3)}{(a-6)(a-7)}}$
 $D_f = (-\infty, -3) \cup (4, 6) \cup (7, +\infty)$
 ب) $y = \sqrt{\frac{a^2-13a+42}{a^2-13a+42}}$ $= \sqrt{\frac{(a-1)(a+3)(a-4)}{(a+1)(a+3)(a-4)}}$
 $D_f = (-\infty, -3) \cup (-1, 1) \cup (4, +\infty)$

ا) $y = \sqrt{r[a]^r}$ $r[a]^r > 0 \rightarrow [a] > r \rightarrow a > r$ $D_f = [r, +\infty)$
 ب) $y = \sqrt{r[a]-\omega}$ $[a] > \frac{\omega}{r} \rightarrow [a] > \frac{\omega}{r}$ $a > \frac{\omega}{r}$ $D_f = [\frac{\omega}{r}, +\infty)$

ا) $y = \sqrt{\frac{a+1}{a+1}}$ $\frac{a+1}{a+1} > 0 \rightarrow a > -1$ $a < 4$
 $|a+1| \neq 0 \rightarrow a \neq -1$
 $D_f = [-1, 4) \setminus \{-1\}$
 ب) $y = \sqrt{[a]^r} + \sqrt{r-[a]}$ $[a]^r > 0 \rightarrow [a] > 0$ $r-[a] > 0 \rightarrow [a] < r$
 $D_f = (0, r)$