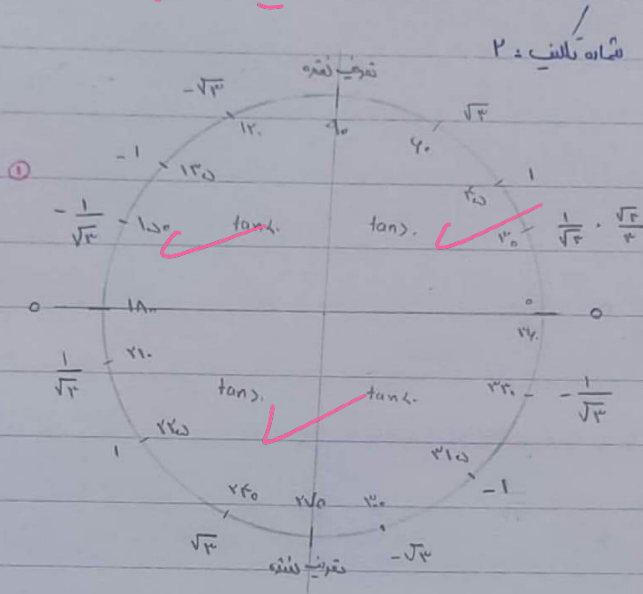


۲. آزمون خوب نوشتن



الف - $\frac{1}{r} - 1 - r = -\frac{r}{r} = -1$

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

$\frac{\sqrt{r}}{r} + \frac{\sqrt{r}}{r} + \frac{r\sqrt{r}}{r} = \frac{r\sqrt{r}}{r}$

$\cos\left(\frac{\pi}{2}\right) + \sin\left(\frac{\pi}{2}\right) = 1 + 1 = 2$

ب - $a^r + r a = r a + r \sim a^r + a - r = 0$

$\frac{(a-1)(a+r)}{-r} \sim a = 1$

$f(1) = \frac{r}{r} = 1$

ج - $r x^r - b \mid x+1 \geq r \sim \begin{cases} x+1 \geq r \rightarrow x \geq r-1 \\ x+1 \leq r \rightarrow x \leq r-1 \end{cases}$

$x = -r$

$11 - b = a - r \sim -a - b = -r \sim a + b = r$

د - $x^r(x-r) = 0 \rightarrow x = 0 \quad x = r$

$P_f = R - \{0, r\}$

$r x^r + r x^r + r x + r = 0 \sim x^r + r x^r + x + r \sim x^r(x+r) + (x+r) \sim (x+r)(x^r+1)$

$P_f = R - \{0, r\}$

ه - $x^r - 1 \geq 0 \sim x^r \geq 1$

$\begin{cases} x \leq -1 \\ x \geq 1 \end{cases} \rightarrow x \geq 1$

$x - r \geq 0 \sim x \geq r$

و - $4 - 4x \geq 0 \rightarrow 4 \geq 4x$

$4x - 4 \geq 0 \rightarrow 4x \geq 4$

$x \geq 1$

$\frac{1}{4} \leq x \leq 1$

⑧ $\sqrt{4x-a} + \sqrt{b-rx}$

$$\begin{cases} 4x-a \geq 0 \rightarrow x \geq \frac{a}{4} \\ b-rx \geq 0 \rightarrow x \leq \frac{b}{r} \end{cases} \rightarrow \frac{a}{4} \leq x \leq \frac{b}{r}$$

$\frac{a}{4} = \frac{b}{r} = r \rightarrow a=4r \quad b=r^2 \rightarrow \frac{b}{a} = \frac{1}{r}$

⑨ $\sqrt{\frac{x^2-x-4}{x^2-13x^2+39}}$ $\rightarrow x' = t \quad t^2 - 13t + 39 \sim (t-4)(t-9) \rightarrow \begin{matrix} x'=4 & x=\pm 2 \\ x'=9 & x=\pm 3 \end{matrix}$

$\sim \frac{(x-4)(x-9)}{-r}$

Sign chart for $\frac{(x-4)(x-9)}{-r}$ with roots at 4 and 9. The expression is positive for $x < 4$ and $x > 9$, and negative for $4 < x < 9$.

$\frac{x^2-x-4}{x^2-13x^2+39} \rightarrow \frac{x-1}{x+1}$ (Note: The denominator simplification in the image appears to be $x^2-13x^2+39 = -12x^2+39$, but the student wrote $x+1$ in the denominator of the simplified fraction, which is likely a typo for x^2+1 or similar.)

$x^2-x-4=0 \rightarrow \frac{(x-4)(x+2)(x-1)}{r}$

$\frac{(x+1)(x+2)(x-1)}{-r}$

⑩ $r[x]-t \geq 0 \quad r[x] \geq t \rightarrow [x] \geq \frac{t}{r} \sim [\frac{t}{r}, +\infty)$

$r[x]-a \geq 0$

$[x] \geq \frac{a}{r} \sim x \geq \frac{a}{r} \sim [\frac{a}{r}, +\infty)$

⑪ $\sqrt{\frac{x+1}{x-1}} + \sqrt{\frac{4-x}{x^2+2x+1}}$ $\rightarrow x \leq 4$ $\begin{cases} -1 \leq x \leq 4, x \neq 1 \\ [-1, 1) \cup (1, 4] \end{cases}$

$\sqrt{[x]-t} + \sqrt{r-[x]}$

$\begin{cases} [x]-t \geq 0 \rightarrow x \geq t \\ r-[x] \geq 0 \rightarrow x \leq r \end{cases} \rightarrow \emptyset$