- کلیپ شماره ۹

الف) $y = x^2 - 5$

$x^2 = y + 5 \rightarrow x = \pm\sqrt{y+5} \geq 0 \rightarrow y \geq -5 \quad [-5, +\infty)$

ب) $y = x^3 + 1 \rightarrow \mathbb{R}$

۲) $y = x^2 - 4x + 6 \rightarrow x^2 - 4x + 4 + 2$

$y = (x-2)^2 + 2 \rightarrow \pm\sqrt{y-2} = x - 2$

$x = \sqrt{y-2} + 2 \rightarrow y \geq 2 \rightarrow [2, +\infty)$

$y = x^2 - 5x + 1 = $

$y = x^2 - 2x - 3x + 1 = y = (x-1)^2 - 3x$

$\pm\sqrt{y + 3x} = x - 1 \rightarrow \sqrt{y+3x} + 1 = x$

$y + 3x \geq 0$ ~~$\rightarrow y \geq 3$~~

۳) $y = \dfrac{x^2 + 3}{x^2 - 2} \rightarrow yx^2 - 2y = x^2 + 3$

$yx^2 - x^2 = +2y + 3$

$\dfrac{x^2(y-1)}{y-1} = \dfrac{2y+3}{y-1} = x = \pm\sqrt{\dfrac{2y+3}{y-1}}$

Ex:

$x = \sqrt{\dfrac{2y+3}{y-1}}$

$-\frac{1}{2}$		1	
$+$	0	$-$	$+$

$(-\infty, -\frac{1}{2}] \cup (1, +\infty)$

$2y + 1 = 0$

$\dfrac{2y}{2} = \dfrac{-1}{2} \quad y = -\dfrac{1}{2}$

$-\dfrac{1}{2} \times 2 + 3$

ب)

$y = \frac{2|x|+1}{|x|-4}$

$|x|y - 4y = 2|x|+1$

$|x|y - 2|x| = 4y+1$

$|x|(y-2) = 4y+1 \Rightarrow |x| = \frac{4y+1}{y-2} \geq 0$

$-\frac{1}{4}$, 2: $+ \quad - \quad +$ → $(-\infty, -\frac{1}{4}] \cup (2, +\infty)$

$4y+1=0 \Rightarrow y = -\frac{1}{4}$

$4+2 = +$ (+)

۴)

$y = \frac{1}{x^2-4x} \Rightarrow \frac{1}{y} = x^2-4x$

$\frac{1}{y} = x^2-4x \Rightarrow \frac{1}{y} = x(x-4)$ $x=0$ $x=4$

$\frac{1}{y} \neq 0$

$y = \frac{1}{4} \Rightarrow (0,+\infty) \cup (-\infty, \frac{1}{4}]$

۵) روش کلی اول

$y = x^2 - 6x + 2 \Rightarrow$

$y = -x^2 + 4x + 2$

$a<0 \Rightarrow \min$

$\frac{-b}{2a} \Rightarrow \frac{-4}{2\times -1} = +2$

$\frac{-\Delta}{4a} = \frac{-16-8}{-4} = +6$

$(-\infty, 6]$

$a>0$ max

$\frac{-\Delta}{4a} = \frac{-36+8}{4} = 7$

$[7, +\infty)$

سوال ۷ و ۹ ریاضی

سوال ۷

الف) $y = x^{۳} + ۳x^{۲} + ۳x + ۱ = ?$

$R_f = \mathbb{R}$

ب) $y = \sqrt{x^{۶} + ۲x^{۳}} + ۹x + ۱ = ? \rightarrow R \in \{...\}$

$R_f = (0, +\infty)$

۹

الف) $y = \sqrt{x^{۲} - ۶x + ۷}$ $\quad a > 0$ max

$b^{۲} - ۴ac$ $\quad (-۶)^{۲} = ۳۶$

$\frac{-\Delta}{۴a} \rightarrow \frac{-۳۶ + ۸}{۴} = \sqrt{-۷}$

$[0, +\infty)$

$y = \sqrt{-x^{۲} + ۴x + ۱۰}$

$\frac{-۱۶ - ۴۰}{-۴} = +۱۴ \rightarrow \sqrt{۱۴} =$

$(-\infty, +۱۴] \rightarrow [0, +\sqrt{۱۴}]$

$y = \frac{ax + b}{cx + d} \rightarrow R - \{\frac{a}{c}\}$

۸) $y = \frac{۳x + ۱}{۱x - ۲} = R - \{۳\}$

$y = \sqrt{\frac{۴x + ۱}{۱x + ۳}} = ? \rightarrow R - [0, +\infty) - \{-۳\}$

$$y = \frac{a}{c} \cdot \frac{r}{1} = r$$

$$y = \frac{2x+1}{x-2}$$

$x = 2$

$$y = \frac{9x-2}{1-2x}$$

$1-2x=0$

$-2x = -1 \quad x = \frac{1}{2}$

$$y = \cos^2 x + \frac{1}{\cos^2 x}$$

$x \neq \frac{1}{2}$

$$y = \sqrt{\frac{x^2+1}{x}}$$

$\frac{x}{c} = \frac{1}{x} \Rightarrow x \neq 0$