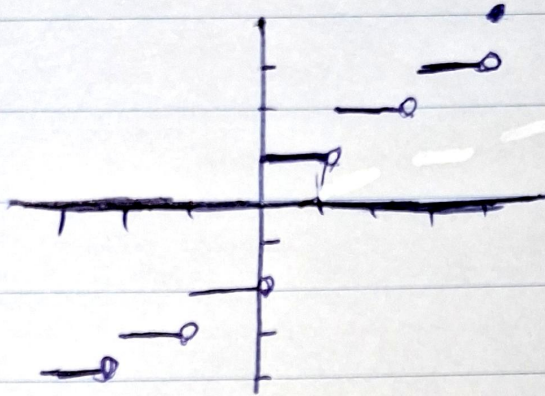


①

الف) $f(x) = 2 \sin^2(x + \frac{\pi}{4}) \Rightarrow R_f = [0, 1]$

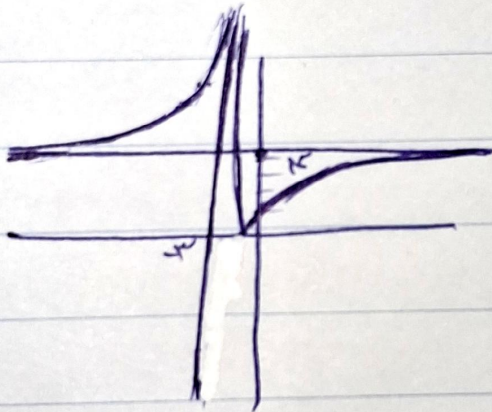
ب) $g(x) = 3 \cos^2 x - 2 \Rightarrow R_g = [-1, 1]$

②



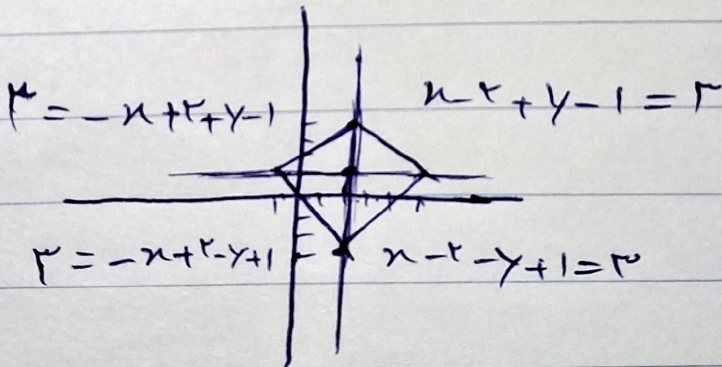
$$f(x) = \frac{n}{|x|} + [x]$$

③



$$f(x) = \left| \frac{x+1}{x+2} \right|$$

④



⑤

الف) $y = t^2 + 2t$

$t \xrightarrow{\sqrt{t}} 1 \Rightarrow R_y = [0, +\infty)$
 $\xrightarrow{+ \infty} + \infty$
 $\xrightarrow{\frac{-b}{2a} = -1}$

$$\hookrightarrow y = -\sinh x^r + r \sinh x + r$$

$$\begin{array}{l} \curvearrowright 1 \rightarrow r \\ \quad \rightarrow -1 \rightarrow 0 \\ \quad \hookrightarrow \frac{-r}{-r} = 1 \end{array} \Rightarrow R_y = [0, r]$$

$$\textcircled{8} f(x) = \frac{-1}{r} x + 10$$

$$9 \times 10 = \frac{1}{r} \left(\frac{(1+9)9}{r} \right) = 90 - 10 = 80$$

$$\textcircled{9} a=0 \quad \begin{cases} r b + c = 0 \\ r b + c = 1 \end{cases} \Rightarrow \begin{matrix} b = 1 \\ c = -r \end{matrix}$$

$$g(x) = \sqrt{x^r + r} \Rightarrow R_g = \sqrt{[r, +\infty)} = [r, +\infty)$$

$$\textcircled{10} f(x) = \frac{x(x-r)(x+r)}{x+r} = x(x-r) \Rightarrow [-1, +\infty)$$

$$x(x-r) = 1 \Rightarrow x = -r \leq r$$

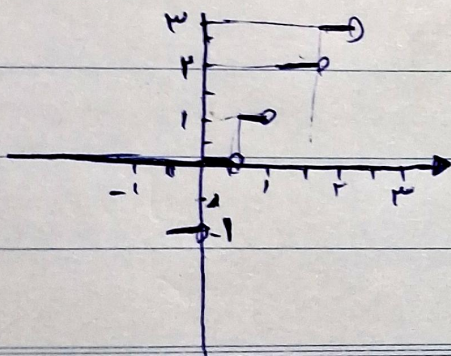
$$\Rightarrow f(-1) = r$$

$$\begin{matrix} a = -r \\ b = r \\ c = -1 \end{matrix}$$

$$\textcircled{11} y = \sqrt{(x-r)^r} = \sqrt{x^r - 4x^r + 16x - 1} \Rightarrow \begin{cases} a = -4 \\ b = 16 \end{cases}$$

$$P_y = [-4, 16] \Rightarrow R_y = [-1, 10]$$

10



10, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10