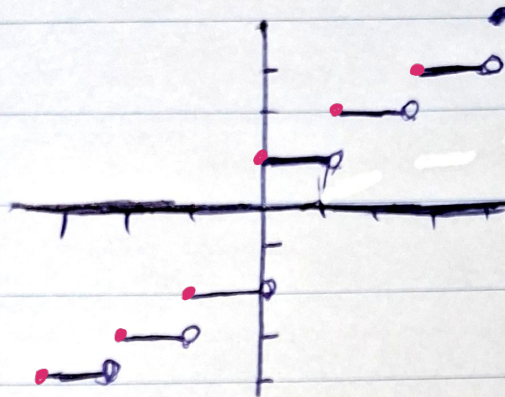


①

الف) $f(x) = 2 \sin^2(x + \frac{\pi}{4}) \Rightarrow R_f = [0, 2]$ (۲)

ب) $g(x) = 3(\cos^2 x - 2) \Rightarrow R_g = [-7, -1]$

②

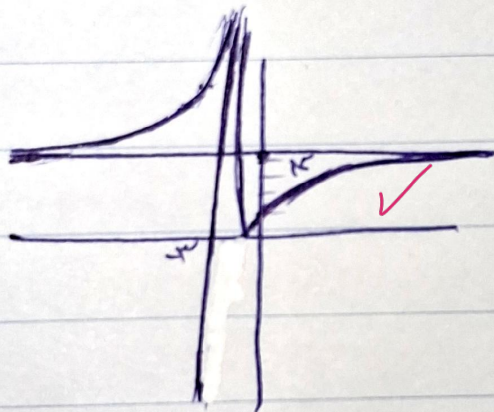


$f(x) = \frac{x}{|x|} + [x]$

دوسرا پاره حفظ باید
مشتق باشد !!

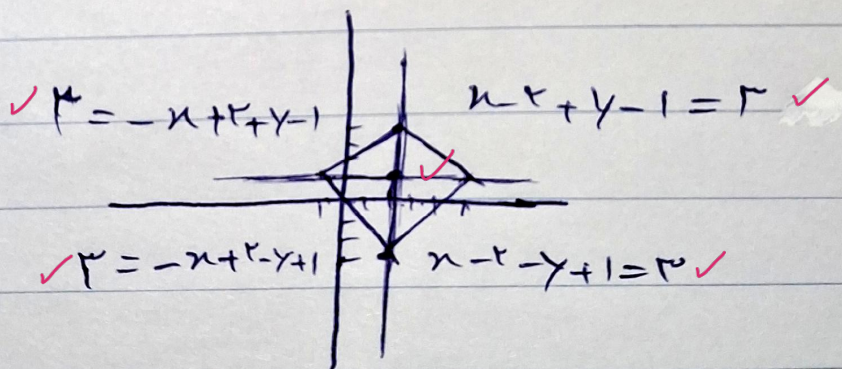
(۱،۵)

③



$f(x) = \left| \frac{4x+1}{x+2} \right|$ (۲)

④



(۲)

⑤

الف) $y = t^2 + 2t$

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

(۱،۵)

صفحه آخر...

$$\hookrightarrow y = -5 \ln x^r + r \ln x + r$$

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

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

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

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

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

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

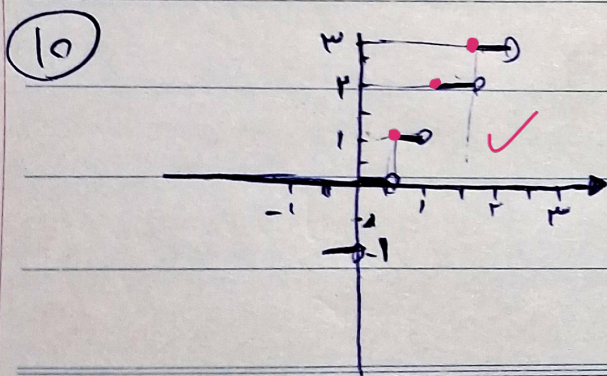
$$n(n-r) = 1 \Rightarrow n = -r \leq r$$

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

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

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

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



$$x, y, z, w$$

$$(1, 2)$$