

الف) $f(x) = 15 \sin^2(x + \frac{\pi}{6}) - 1$

$\sin x \rightarrow 1 \rightarrow 1$
 $\rightarrow 0 \rightarrow -1$ $R = [-1, 1]$

ب) $g(x) = 3 \cos^3 x - 2$

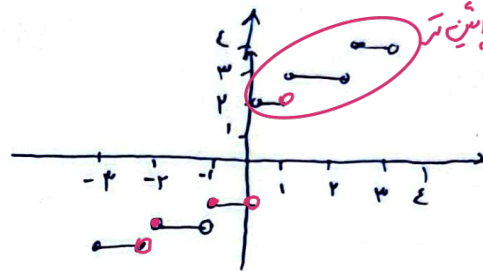
$\cos x \rightarrow 1 \rightarrow 1$
 $\rightarrow -1 \rightarrow -1$ $R = [-1, 1]$

(۲)

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$y = \frac{x}{|x|} + [x]$

$-3 \leq x < 0 \rightarrow -1 + [x]$ $0 \leq x < 3 \rightarrow 1 + [x]$

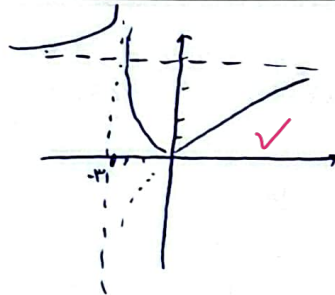


صفحه آخر...

(۱)

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$y = \frac{|x+1|}{x+3}$



(۲)

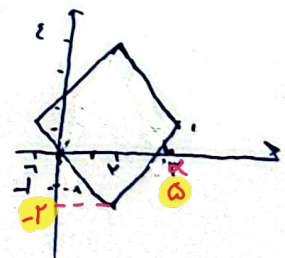
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$|y-1| = 2|x-2|$

$2 - (x-2) \geq 0 \rightarrow -1 \leq x \leq 5$

$y \geq 1 \rightarrow y-1 = 2 - (x-2) \rightarrow y = 4 - (x-2)$ $\begin{cases} -1 \leq x \leq 2 \rightarrow y = x+2 \\ 2 \leq x \leq 5 \rightarrow y = -x+4 \end{cases}$

$y < 1 \rightarrow -y-1 = 2 - (x-2) \rightarrow y = |x-2| - 2$ $\begin{cases} -1 \leq x \leq 2 \rightarrow y = -x \\ 2 \leq x \leq 5 \rightarrow y = x-2 \end{cases}$



(۱, ۷, ۵)

۴

الف) $f(x) = x + \frac{1}{x} + 2\sqrt{x + \frac{1}{x}}$ $\rightarrow t + 2\sqrt{t}$
 $x = -\frac{1}{x}$

$R = (1 + 2\sqrt{2}, +\infty)$

(۲)

۵

ب) $f(x) = (1 - \sin x)(1 + \sin x) \rightarrow \begin{cases} \sin x = 1 \rightarrow x = \frac{\pi}{2} \\ \sin x = -1 \rightarrow x = \frac{3\pi}{2} \end{cases} \rightarrow R = [0, 2]$

$$1 \rightarrow \frac{1}{\mu} \quad 2 \rightarrow \frac{2}{\mu} \quad 3 \rightarrow 9 \quad 4 \rightarrow \frac{4}{\mu} \quad 5 \rightarrow \frac{5}{\mu} \quad 6 \rightarrow \frac{6}{\mu} \quad 7 \rightarrow \frac{7}{\mu} \quad 8 \rightarrow \frac{8}{\mu} \quad 9 \rightarrow \frac{9}{\mu}$$

$$\frac{19 + 21 + 24 + 27 + 30 + 33 + 36 + 39 + 42 + 45}{10} + 9 + 11 + 13 = 100$$

(2)

حل
في $[+1, +\infty)$ ليس له حلول
حل $a = -1$

$$f(x) = \sqrt{ax^2 + bx + c}$$

$$\begin{cases} 2b + c = 0 \\ 3b + c = 1 \end{cases} \rightarrow \begin{cases} b = 1 \\ c = -2 \end{cases}$$

$$g(x) = \sqrt{x^2 + 1} \rightarrow D = \mathbb{R}$$

بطل بنوع

$$R = [1, +\infty)$$

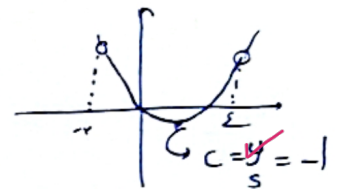
صفحة آخر...

(1, 1.5)

$$f(x) = \frac{x^3 - 5x}{x+1} \rightarrow \frac{x(x-5)(x+1)}{x+1} \rightarrow x(x-5)$$

$$\frac{x^3 - 5x}{x+1} = 1 \rightarrow x^3 - 5x = x + 1 \rightarrow x^3 - 6x - 1 = 0 \rightarrow \omega = \frac{-1 \pm \sqrt{5}}{2}$$

$$f\left(\frac{a+b}{2}\right) = f\left(\frac{-1+1}{2}\right) = 0$$



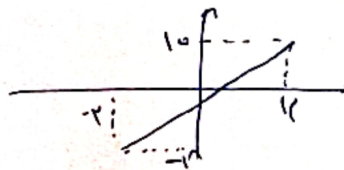
(2)

$$\sqrt[3]{(x-1)^3} = \sqrt[3]{x^3 - 3x^2 + 3x - 1}$$

حل

$$f(x) = x - 1 \rightarrow D = [-1, 1]$$

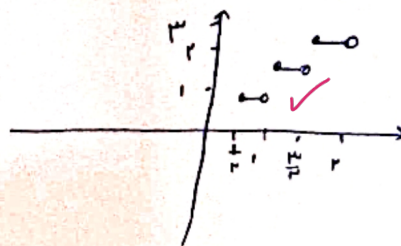
$$R_f = [-1, 1]$$



(2)

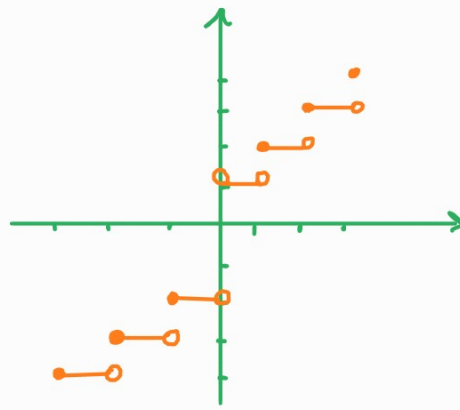
$$y = (n+1) + (n+1)^2$$

$$\begin{aligned} [1, 1] &\rightarrow y = 1 \\ [1, 2] &\rightarrow 1 + 1 = 2 \\ [1, 3] &\rightarrow 1 + 2 = 3 \end{aligned}$$



(2)

$$y = \begin{cases} [x] + 1 & x > 0 \\ [x] - 1 & x < 0 \end{cases} \Rightarrow$$



-۲

۷- با توجه به دامنه، زیر رادیکال یک خط با شیب مثبت بوده یعنی $a=0$ است و نقطه $(2,0)$ هم در معادله خط صدق می‌کند...

$$\begin{cases} (2,0) \rightarrow 2b + c = 0 \\ (3,1) \rightarrow 3b + c = 1 \end{cases} \rightarrow b = 1 \text{ و } c = -2$$

$$g(x) = \sqrt{x^2 + 4} \rightarrow \text{ext} \Big|_4^0 \Rightarrow R_g = \sqrt{[4, +\infty)} = [2, +\infty)$$