

نام و نام خانوادگی (کسر بیاورد) پاسخنامه تشریحی تکلیف شماره کلاس دبیر
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$f(0) = 0, f(1) = 2, \dots, f(0) = 1$
 $x=1 \rightarrow f(-1) - f(1) = 0 \rightarrow f(-1) = 2, f(1) = 0$
 $x=-1 \rightarrow f(1) - f(-1) = 0 \rightarrow f(1) = 2, f(-1) = 0$
 $x=2 \rightarrow f(2) = 2f(1) = 0$
 $x=-2 \rightarrow f(2) = 2f(-2) = 0 \rightarrow f(2) = 0, f(-2) = 0$
 $I, II \rightarrow f(-2) = 0, f(2) = 0, f(0) = 1$
 $f(x) = ax^3 + bx^2 + cx + d$
 $f(0) = 1 \Rightarrow d = 1$
 $f(1) = 0 \Rightarrow a + b + c + 1 = 0 \Rightarrow a + b + c = -1$
 $f(-1) = 0 \Rightarrow -a + b - c + 1 = 0 \Rightarrow -a + b - c = -1$
 $f(2) = 0 \Rightarrow 8a + 4b + 2c + 1 = 0 \Rightarrow 8a + 4b + 2c = -1$
 $f(-2) = 0 \Rightarrow -8a + 4b - 2c + 1 = 0 \Rightarrow -8a + 4b - 2c = -1$
 $\rightarrow 8a = \frac{1}{4}, a = \frac{1}{32}, c = -\frac{5}{32}$
 $f(x) = \frac{1}{32}x^3 - \frac{5}{32}x^2 + \frac{1}{32}x + 1$

$x=0 \rightarrow 2f(0) = 4, f(0) = 2, f(x) = x^2 - 2x + 2$

$f(x^2) = x^4 - 2x^2 + 2$

$ym - y = x^2 + x + 2, x^2 + (1-y)x + y + 2 = 0, x = \frac{y-1 \pm \sqrt{(y-1)^2 - 4(y+2)}}{2}$
 $(y-1)^2 - 4(y+2) \geq 0, y^2 - 2y + 1 - 4y - 8 \geq 0, y^2 - 6y - 7 \geq 0, (y-7)(y+1) \geq 0$
 $\frac{-1}{-1-7} \leq y \leq \frac{7}{7-(-1)}$
 $R = [1R, (-1, 7)]$

$a) x = -\frac{b}{2a} = -\frac{5}{2}, 2, \frac{5}{14} - \frac{5}{2} + 1 = -\frac{5}{2} + \frac{1}{2} = -\frac{4}{2} = -2, R = [-\frac{17}{2}, +\infty)$

$b) x_{max} = -\frac{b}{2a}, x_{min} = -\frac{4}{-2} = 2 \rightarrow -9 + 18 - 5 = 4, R_{min} = (-\infty, 2], R = [0, 2]$

$c) R = [0, +\infty) \leftarrow \text{برای چه عددی زیر اینها 1R است.}$

$d) x^2 - 4x + 1, \forall x + t = \square, -\infty \leq \square \leq +\infty, \log \square \leq +\infty$

$R = 1R$

$a) \text{ (الف) } R = 1R - \{ \frac{1}{e} \}$
 $b) \text{ (ب) } R = 1R - \{ \frac{1}{e} \}$
 $c) \text{ (ج) } y = \frac{x^2 + 2x + 1}{\sqrt{x^2 + 2x}} = \frac{\sqrt{x^2 + 2x} + 1}{\sqrt{x^2 + 2x}}$
 $\frac{1}{\sqrt{x^2 + 2x}} \rightarrow y \geq \frac{1}{\sqrt{2}}$
 $R = [\frac{1}{\sqrt{2}}, +\infty)$
 $d) \text{ (د) } y = \frac{x^2 + t}{x^2 + 1} = t \rightarrow \frac{1}{x^2 + 1} = \frac{t}{x^2 + 1} \rightarrow x^2 + 1 = \frac{1}{t} \rightarrow x^2 = \frac{1}{t} - 1$
 $y \geq \frac{1}{2}, R = [0, 1, 2, +\infty)$

$$y x^r - y = r x^{r-1} t \quad (y-r) x^r - y - t = 0 \quad x = \pm \sqrt{r(y+t)(y-r)}$$

$$t(y+t)(y-r) > 0 \quad \frac{-t}{y-t} = R = \mathbb{R} - (-t, r] \quad y = r$$

توجه: اگر $r < 0$ و $y < r$ باشد، x و t حقیقی نیستند.

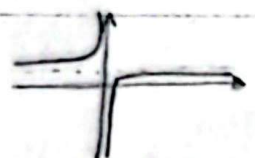
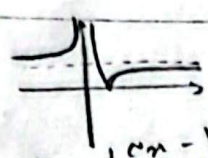
$$x^r = 0 \quad y = -t \quad x^r \rightarrow +\infty \quad y = r \quad \frac{y}{x} = \frac{r}{x} \quad R = (-\infty, -t] \cup (r, +\infty)$$

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$$\sin x = -1 \quad y = -\frac{\pi}{2} \quad \sin x = 1 \quad y = \frac{\pi}{2} \quad R = [-\frac{\pi}{2}, \frac{\pi}{2}]$$

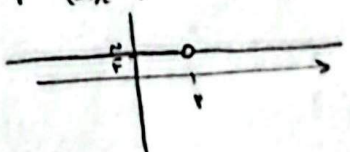
مجموعه مقادیر

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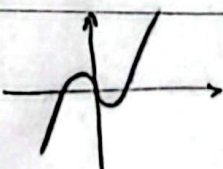
الف)  $\rightarrow$  $R = [0, +\infty)$

$$g = \frac{e^x - 1}{x} \quad y = \left| \frac{e^x - 1}{x} \right|$$

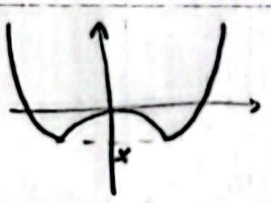
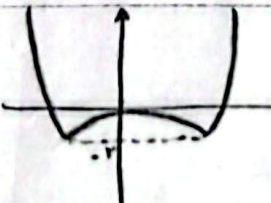
ب) $y = \sqrt{\frac{9(x-2)}{x(x-2)}} = \frac{3}{x} \quad R = \{\frac{3}{x}\}$



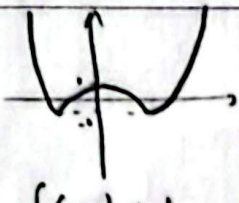
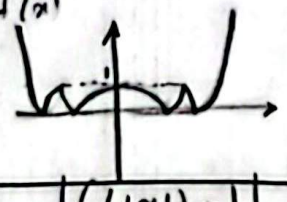
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$$y = \begin{cases} x^r - 2x & x \geq 0 \\ -x^r - 2x & x \leq 0 \end{cases} \quad R = \mathbb{R}$$


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 $\xrightarrow{|x|}$


تابع را به توان می‌رسانیم

 $\xrightarrow{\frac{f(x)}{x}}$

 $f(|x|) + 1$

 $|f(|x|) + 1|$

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