

نام و نام خانوادگی شماره کلاس بازدهم فصل A پاسخنامه تشریحی تکلیف شماره ۳

الف) $\frac{x^3}{x^3 + 3x^2 - 18x + 3} \rightarrow \neq 0$ $\frac{x+3}{(x-1)(x-\frac{1}{2})(x+3)} \neq 0$

ب) $2x^3 + 9x^2 + 6x + 3 \neq 0$

الف) $\frac{x^3}{x^3 + 3x^2 - 18x + 3} \mid x-1$
 $\frac{-x^3 + 3x^2}{0x^2 - 18x + 3}$
 $\frac{-18x + 3}{-18x + 3}$
 $\frac{0}{0}$
 $\frac{x^2 + 3x - 3}{(x + \frac{1}{2})(x-1)}$

ب) $\frac{x^3}{2x^3 + 9x^2 + 6x + 3} \mid x+1$
 $\frac{-x^3 - 9x^2 - 6x - 3}{0x^2 + 15x + 6}$
 $\frac{-15x - 6}{-15x - 6}$
 $\frac{0}{0}$
 $\frac{x^2 + 6x + 2}{(x-1)(x+1)(x+\frac{1}{2})} \neq 0$
 $x \neq 1, x \neq -1, x \neq -\frac{1}{2}$
 $D_f = \mathbb{R} - \{-1, -\frac{1}{2}, 1\}$

الف) $x^3 - 2x^2 + 2x - 1 \neq 0$

ب) $\frac{x^3}{x^3 - 2x^2 + 2x - 1} \rightarrow -\frac{1}{x-1}$

الف) $\frac{x^3}{x^3 - 2x^2 + 2x - 1} \mid x-1$
 $\frac{-x^3 + 2x^2}{-x^2 + 2x - 1}$
 $\frac{+x^2 - x}{x-1}$
 $\frac{-x+1}{0}$
 $\frac{1}{(x-1)(x^2 - x + 1)} \neq 0$

ب) $\frac{x^3}{x^3 - 2x^2 + 2x - 1} \rightarrow -\frac{1}{x-1}$
 $\frac{-x}{x-1} = \frac{1}{1-x}$
 $D_f = (-\infty, -1] \cup (1, +\infty)$

$x^2 - 2|x-1| - 2x + 3 \neq 0$ $|x-1| \begin{cases} x-1 \\ -x+1 \end{cases}$

$x-1 \Rightarrow x^2 - 2x + 2 - 2x + 3 \rightarrow x^2 - 4x + 5 \neq 0$
 $x = \frac{4 \pm \sqrt{16-20}}{2} = \frac{4 \pm 2}{2}$
 $x = 1, x = 3$

$-x+1 \Rightarrow x^2 + 2x - 2 - 2x + 3 \rightarrow x^2 - 1 \neq 0$
 $x = 1, x = -1$

$\Rightarrow x^2 + 3x = 0 \rightarrow x(x+3) = 0$
 $x = 0, x = -3$

$D_f = \mathbb{R} - \{0, 1, 3, -1\}$

الف) $|2x+1| - |x+3| \neq 0 \rightarrow (2x+1)^2 = (x+3)^2 \rightarrow 4x^2 - 2x - 8 = 0$

$\Rightarrow x^2 - 2x - 2 \rightarrow (x - \frac{2}{2})(x + \frac{2}{2}) = 0$ $x \rightarrow \frac{2}{2}, -\frac{2}{2}$

ب) $|2x+1| - |x+3| \geq 0 \rightarrow |2x+1| \geq |x+3| \rightarrow (2x+1)^2 \geq (x+3)^2$

$4x^2 - 2x - 8 \geq 0 \rightarrow (x-2)(x+\frac{2}{3}) \geq 0$ $x \rightarrow 2, -\frac{2}{3}$

$\frac{-\frac{2}{3}}{+\frac{2}{3} - \frac{2}{3} +}$
 $(-\infty, -\frac{2}{3}] \cup [2, +\infty)$

الف) $1 - \log_2^x > 0 \rightarrow x > 0$ $\log_2^x x+1$ $x \leq 2$ $0 < x < 2$

ب) $1 - \log_2^x > 0 \rightarrow x > 0$ $\log_2^x < 1$ $x < \frac{1}{2}$ $0 < x < \frac{1}{2}$

$x-1 > 0 \quad x > 1 \quad x > \frac{1}{x} \quad ①$ $\log_a(x-1) > 0 \quad x-1 > 1 \quad x > 2 \quad x > 1 \quad ② \quad \text{①} \cap \text{②} \rightarrow x > 2$	6
١) $\cos x + 1 > 0 \quad \cos x > -1 \quad \cos x > -\frac{1}{2} \quad D_x = (2k\pi + \frac{2\pi}{3}, 2k\pi + \frac{4\pi}{3})$ $\rightarrow \frac{x-1}{x+1} > 0 \quad \frac{-1}{+3} - \frac{1}{-1} + \quad (-\infty, -1) \cup [1, +\infty) \quad ① \quad \log \frac{x-1}{x+1} > 0$ $\frac{x-1}{x+1} > 1 \quad \frac{x-1}{x+1} - 1 > 0 \quad \frac{-x}{x+1} > 0 \quad x > -1 \quad ② \quad \text{①} \cap \text{②} \rightarrow [1, +\infty)$	7
$x, -x \Rightarrow x \rightarrow \begin{cases} ka + la + b = 0 \\ ca + la + b = 0 \end{cases} \Rightarrow b = 1a$ $x \rightarrow \begin{cases} ka + la + b = 0 \\ ca + la + b = 0 \end{cases} \Rightarrow b = 1a$	8
(جواب) $\frac{2m+1}{m+1}$ $(x^2 + 2x+1) + (1-m)(m+1) \geq 0 \quad \frac{(x+1)^2}{m+1} + (1-m)(m+1) \geq 0$ $0 + (1-m)(1+m) \geq 0 \rightarrow m=1 \quad 1-(-1)=2$ $m=-1$	9
$\varepsilon - x^2 > 0 \quad (\varepsilon - x)(\varepsilon + x) > 0 \quad \frac{-\varepsilon}{1} \frac{\varepsilon}{1} \rightarrow [-\varepsilon, \varepsilon]$ $[x] + [-x] = \begin{cases} 0 & x \in \mathbb{Z} \\ -1 & x \notin \mathbb{Z} \end{cases} \rightarrow \{1, 2, 0, -1, -2\} \rightarrow \text{مجموعه صحیح}$	10