

الف) $y^3 - x = 2x^2$ تابع ✓

$y_1^3 = x + 2x^2$
 $y_2^3 = x + 2x^2$ } $y_1^3 = y_2^3 \Rightarrow y_1 = y_2$

ب) $|y| + x^2 = x + 3$

$x=0$

$|y| = 3 \quad y = \pm 3$

تابع X

ج) $\sqrt{x-4} + |y-2| = 0$ تابع ✓

$y-2=0$

$y=2$

$\sqrt{x-4}=0$

$x-4=0$

$x=4$

د) $x = \cos y$

$x=0$

$\cos y = 0$

$y = 90, 270$

تابع X

الف) $y = \frac{x+4}{x^2-4x}$

$x^2-4x \neq 0$

$x(x-4) \neq 0$

$x \neq 0$

$x \neq 4$

$D = R - \{0, 4\}$

ب) $y = \frac{x+4}{x^2-7x+14}$

$x^2-7x+14 \neq 0$

$\Delta = b^2-4ac = 49-4 \cdot 14 = -15$

$\Delta < 0$ ریشه ندارد

$D = R$

ج) $y = \frac{x+4}{x^2+x+4}$

$\Delta = b^2-4ac = 1-16 = -15$

$\Delta < 0$ ریشه ندارد

$D = R$

د) $y = \frac{x+4}{x^2-4x}$

$x^2-4x \neq 0$

$x^2(x^2-4) \rightarrow x^2(x-2)(x+2) \neq 0$

$x \neq 0 \quad x \neq 2 \quad x \neq -2$

$D = R - \{0, -2, 2\}$

الف) $y = \sqrt{4-x} + \sqrt{x-2}$

$4-x \geq 0$

$4 \geq x$

$x-2 \geq 0$

$x \geq 2$

$D: 2 \leq x \leq 4$

ج) $y = \frac{\sqrt{x-2}}{x-4}$

$x-2 \geq 0$

$x \geq 2$

$x \neq 4$

$x-4 \neq 0$

$D = [2, +\infty) - \{4\} = [2, 4) \cup (4, +\infty)$

ب) $y = \frac{3x+1}{x^2+1}$

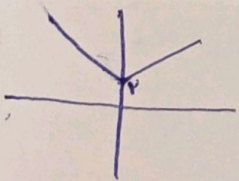
$D = R$

د) $y = \frac{2x+3}{|x|+x^2}$

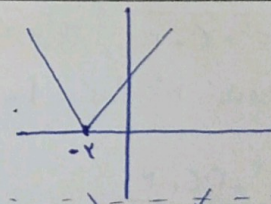
$0, + \quad 0, +$

$D = R - \{0\}$

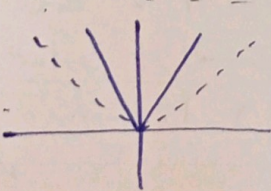
الف) $y = |x| + 2$



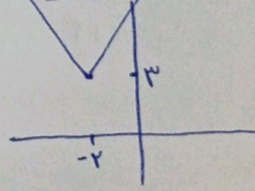
ج) $y = |x+2|$



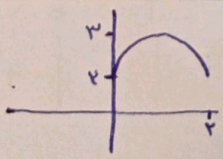
ب) $y = 2|x|$



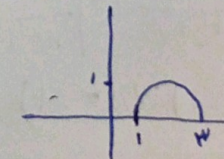
د) $y = |x+2| + 3$



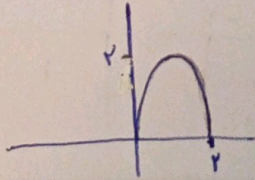
الف) $f(x) + 2$



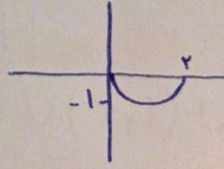
ج) $f(x-1)$



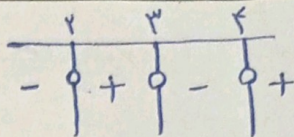
ب) $2f(x)$



د) $-f(x)$

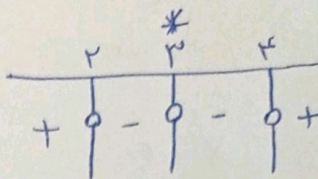


الف) $y = (x-2)(x-3)(x-4)$



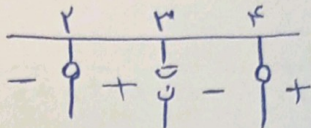
4

ب) $y = (x-2)(x-3)^2(x-4)$



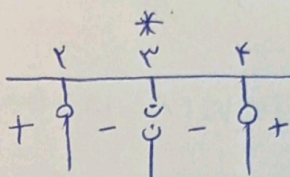
6

الف) $y = \frac{(x-2)(x-4)}{x-3}$



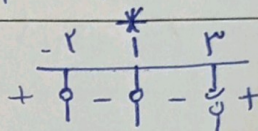
5

ب) $y = \frac{(x-2)(x-4)}{(x-3)^2}$



7

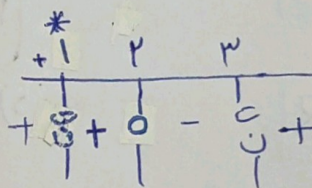
الف) $y = \frac{x^3 - 3x + 2}{x-3} = \frac{(x-1)^2(x+2)}{x-3} \Rightarrow$



$a+b+c=0$

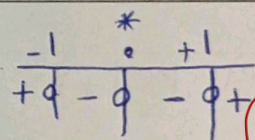
$1-3+2=0 \Rightarrow$ $(x^3 - 3x + 2) \div (x-1) = (x-1)(x+2)$
 (بما ان $x=1$ جذر $x^3 - 3x + 2$)

ب) $y = \frac{x^3 - 3x + 2}{x^2 - 4x + 3} = \frac{(x-1)(x-2)}{(x-1)(x-3)} \Rightarrow$



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الف) $y = \frac{x^4 - x^2}{x^2 + x + 2} = \frac{x^2 - x^2}{x^2 + x + 2} = \frac{x^2(x^2 - 1)}{x^2 + x + 2} = \frac{x^2(x-1)(x+1)}{x^2 + x + 2} \Rightarrow$



$x^2 + x + 2 \Rightarrow \Delta = b^2 - 4ac = 1 - 8 = -7 < 0 \Rightarrow$ (لا يوجد جذور حقيقي)

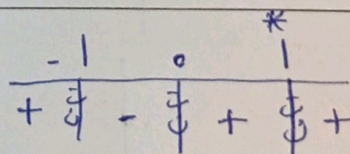
9

ب) $y = \frac{x^4 + 3x + 4}{x^2 + 2x + 3}$

$x^4 + 3x + 4 \Rightarrow \Delta = b^2 - 4ac = 9 - 16 = -7 < 0 \Rightarrow$ (لا يوجد جذور حقيقي)
 $x^2 + 2x + 3 \Rightarrow \Delta = b^2 - 4ac = 4 - 12 = -8 < 0 \Rightarrow$ (لا يوجد جذور حقيقي)

9

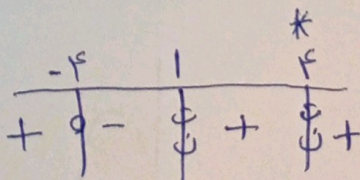
الف) $y = \sqrt{\frac{x^3 - 1}{x^3 - x}} = \sqrt{\frac{(x-1)(x^2 + x + 1)}{x(x-1)(x+1)}} \Rightarrow$



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$D = (-\infty, -1) \cup (0, 1) \cup (1, +\infty)$

ب) $\sqrt{\frac{x^2 - 14}{x^2 - 5x + 4}} = \sqrt{\frac{(x-4)(x+4)}{(x-4)(x-1)}} \Rightarrow$



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$D = (-\infty, -4] \cup (1, 4) \cup (4, +\infty)$