

طالع‌های حیران اعصار

الف) $y^3 - 2x^2 = 2x - 1 \rightarrow y^3 = 2x^2 + 2x - 1 \Rightarrow y = \sqrt[3]{2x^2 + 2x - 1}$ تابع
 $2x^2 + 2x - 1 \rightarrow$ درجه ۲ تابع

ب) $x \cos y = y \cos x \quad x = \frac{\pi}{2} \rightarrow \frac{\pi}{2} \cos y = y \cos \frac{\pi}{2} \Rightarrow y = \frac{\pi}{2}, \frac{3\pi}{2}, \frac{5\pi}{2}, \dots$
 $\Rightarrow$ تابع نیست

ج) $\frac{x+y}{2} = \sqrt{xy} \quad x, y > 0 \quad x+y = 2\sqrt{xy} \rightarrow x+y - 2\sqrt{xy} = 0 = (\sqrt{x} - \sqrt{y})^2 = 0$
 $\Rightarrow \sqrt{x} = \sqrt{y} \Rightarrow x = y \Rightarrow$ تابع هست

10.

د) $xy^2 + 2x - y^3 - 2y = 0 \rightarrow x(y^2 + 2) - y(y^2 + 2) = (y^2 + 2)(x - y) = 0$
 $\Rightarrow x - y = 0 \Rightarrow x = y \Rightarrow$ تابع هست

ه) $|y| + x^2 = 2y \Rightarrow |y| - 2y + x^2 = 0 \Rightarrow -2y > 0 \Rightarrow y < 0 \Rightarrow y = -2y + x^2$
 $\Rightarrow y = x^2$ تابع هست

15.

و) $[y] + [x] = 1 \quad \text{if } x = \frac{1}{2} \quad [y] + 0 = 1 \Rightarrow [y] = 1 \Rightarrow 1 \leq y < 2 \rightarrow$ تابع نیست

ز) $\begin{cases} 2x^2 - b & |x-1| \geq 2 \\ a + 2x & 0 \leq x \leq 3 \end{cases} \quad |x-1| \geq 2 \rightarrow x-1 \geq 2 \rightarrow x \geq 3$
 $x-1 \leq -2 \rightarrow x \leq -1$

20.

ح) $\begin{matrix} 3 & \rightarrow & 1a - b \\ & \searrow & c + a \end{matrix} \rightarrow a + b = 12$
 $a, b = 1$ یعنی $\frac{-b}{a} = \frac{b}{-1} = -b \rightarrow a + b = -b \Rightarrow a = -2b$
 $\frac{c}{a} = \frac{a}{-1} = -a \rightarrow ab = -a \Rightarrow b = -1$
 $a = -2b, b = -1 \Rightarrow a = 2, b = -1 \quad 2 + (-1) = 1$

25.

ط) $ax^2 + bx + c \geq 0 \rightarrow$ بازه یابنده صفر است $\Rightarrow a = 0 \rightarrow bx + c \rightarrow rb + c = 0$
 $c = -rb$

ث) $3a + c - r|b| = 3a + c + 3b = (3 \times 0) + (-2b) + rb = b$

30.

Subject:

Year: Month: Day: ()

Page: ()

$$\sqrt{x-2} = 2 \quad x+b=0 \Rightarrow b=-2 \quad \frac{3x+2}{x-2} - 2 = \frac{1}{x-2} \quad -4$$

$$12x = 0 \quad \frac{a}{c} = 0 \quad (3+a)x = 0 \Rightarrow a = -3$$

$$\text{الف) } \sqrt{x^2-x} \quad x(x^2-1) \geq 0 \quad \begin{array}{c} -1 & 0 & 1 \\ | & | & | \\ - & + & - \end{array} \quad D = [-1, 0] \cup [1, +\infty) \quad -V$$

5

$$\text{ب) } \frac{1}{\sqrt{|x|-1}} \quad |x|-1 > 0 \rightarrow |x| > 1 \quad x > 1 \vee x < -1 \quad (1, +\infty) \cup (-\infty, -1)$$

$$\text{الف) } |x| - [x] = 0 \rightarrow |x| = [x] \Rightarrow D = \mathbb{R} \quad -W$$

10

$$\text{ب) } \sqrt{x} + \sqrt{y} = 9 \Rightarrow \sqrt{y} = 9 - \sqrt{x} \quad 9 - \sqrt{x} \geq 0 \rightarrow x \leq 81 \quad x \geq 0 \quad 0 \leq x \leq 81$$

$$\left[rx - \frac{1}{r} \right] = \left[rx - \frac{1}{r} + 1 \right] - 1 \rightarrow \left[rx + \frac{r}{r} \right] = \left[rx + \frac{1}{r} \right] + 1 \quad -9$$

15

$$\rightarrow r \left[rx + \frac{1}{r} \right] > 0 \rightarrow rx + \frac{1}{r} \geq 0 \rightarrow rx \geq -\frac{1}{r} \rightarrow x \geq -\frac{1}{r^2} = D$$

$$rx - a > 0 \rightarrow x > \frac{a}{r} \quad -10$$

$$1 - \log(rx-a) \geq 0 \rightarrow 1 \geq \log_1(rx-a) \rightarrow 1 \geq rx-a \rightarrow \frac{1+a}{r} \geq x$$

20

$$\Rightarrow \frac{a}{r} < x < \frac{1+a}{r} \Rightarrow -\frac{a}{r} + \frac{1+a}{r} = \frac{1}{r} = D$$

25

30