

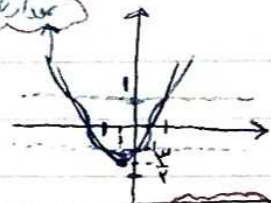
مسئله خفای (دارم B و سببها)

نقطه تابع است

تابع خطی $y = kx + \frac{1}{k}$

1

الف) $y^3 - 2y^2 + 2y - 1$
 $y = \sqrt{2y^2 + 2y - 1}$



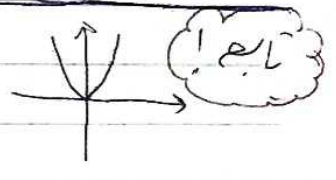
ب) $x(\cos y) = y(\cos x)$
 $x = \frac{\pi}{2} \rightarrow \frac{\pi}{2} \cos y = y \cos \frac{\pi}{2} \rightarrow \frac{\pi}{2} \cos y = 0$

ج) $\frac{x+y}{2} \geq \sqrt{xy}$ $x+y > 0$
 $x+y \geq 2\sqrt{xy} \rightarrow x+y-2\sqrt{xy} = 0 \rightarrow (\sqrt{x}-\sqrt{y})^2 \geq 0$

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

2

الف) $|y| + x^2 \geq 2y$
 $x^2 - y \geq 2y \rightarrow x^2 \geq 3y$
 $y < 0 \rightarrow x^2 - y \geq 2y \rightarrow x^2 \geq 3y$



ب) $[y] + [x] = 1$
 و این نشان می‌دهد که x و y هر دو عدد صحیح نیستند و یکی از آنها عدد صحیح و دیگری عدد صحیح و کسری است.

3

$f(x) = \begin{cases} 2x^2 - b & |x-1| \geq 2 \\ ax^2 & 0 \leq x \leq 3 \end{cases}$
 $ab = ?$
 $x = -1, 2, 3 \rightarrow 2x^2 - b \geq 0$
 $x = 0, 1 \rightarrow ax^2 \geq 0$
 $ab \geq 12$

4

$f(x) = \sqrt{a-bx-x^2}$
 $\{b, a\} \rightarrow$ $a \geq b$
 $ab > ?$
 $ab \geq 2-1 = 1$

5

$y = \frac{r}{\sqrt{a^2 + b^2}}$
 $bf = (-\frac{1}{2}, 2) \rightarrow$
 $a \geq 0 \rightarrow bx + c \geq 0$
 $2b + c \geq 0 \rightarrow c \geq -2b$

Elegance

$$y = \sqrt{\frac{r^2 + b^2}{r + b}} \rightarrow \frac{r^2 + b^2}{r + b}$$

$$\hookrightarrow \frac{(r+b)x + ab}{r+b} \rightarrow a = -r \rightarrow \frac{r^2 + b^2}{r+b} \rightarrow b = -r$$

(4)

$$y = \sqrt{x^2 - 2x}$$

$$\hookrightarrow x(x-2) \geq 0 \rightarrow [-2, 0] \cup [2, +\infty) \Rightarrow D_f$$

(V)

$$y = \frac{1}{\sqrt{|x|-1}}$$

$$\rightarrow |x| > 1 \rightarrow x > 1 \rightarrow (R - \{1\}) \Rightarrow D_f$$

(4)

$$y = \sqrt[3]{\frac{1}{|x|-1}} \rightarrow |x| \neq 1 \rightarrow \mathbb{R} - \{1\}$$

(A)

$$y = \sqrt{x+9}$$

$$x \geq -9 \rightarrow \sqrt{x+9} \geq 0 \rightarrow 9 - \sqrt{x+9} \geq 0 \rightarrow 9 \geq \sqrt{x+9} \rightarrow x \leq 0$$

(0, 9]

$$D_f = \left[\frac{1}{e}, +\infty\right)$$

$$\leftarrow x \geq \frac{1}{e} \rightarrow x \geq \frac{1}{e} \rightarrow x + \frac{1}{x} \geq 2$$

(4)

$$y = \sqrt{\frac{1}{x-\frac{1}{x}} + \frac{1}{x+\frac{1}{x}}} \rightarrow \frac{1}{x-\frac{1}{x}} + \frac{1}{x+\frac{1}{x}} \geq 0$$

$$\hookrightarrow \frac{x^2 + 1}{x^2 - 1} + \frac{x^2 - 1}{x^2 + 1} \geq 0 \rightarrow \frac{(x^2 + 1)^2 - (x^2 - 1)^2}{(x^2 - 1)(x^2 + 1)} \geq 0$$

$$\rightarrow \frac{4x^2}{(x^2 - 1)(x^2 + 1)} \geq 0 \rightarrow x^2 > 1 \rightarrow x > 1 \text{ or } x < -1$$

(4)

$$y = \sqrt{1 - \log(r^2 - a)} \rightarrow r^2 > a \rightarrow r > \sqrt{a} \rightarrow a = b$$

(10)

$$D_f = [b, a]$$

Elegance

$$\hookrightarrow \Delta = \frac{a}{x} + \frac{a}{x} \geq 2\sqrt{a^2} = 2a$$

$$1 - \log(r^2 - a) \geq 0 \rightarrow 1 \geq \log(r^2 - a) \rightarrow 10 \geq r^2 - a$$

$$\rightarrow 10 + a \geq r^2 \rightarrow 10 + a \geq r^2 \rightarrow 10 + a \geq r^2$$

(C2) (10)