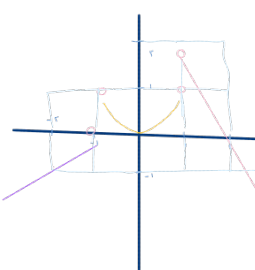


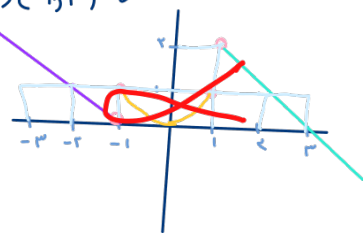
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|
| <p>الف) <math>y_1^3 = 2x_1^2 - 1 \xrightarrow{x_1 = x_2} y_1^3 = y_2^3 \Rightarrow y_1 = y_2</math> <span style="color: red;">تابع است ✓</span></p> <p><math>y_2^3 = 2x_2^2 - 1</math> <span style="color: red;">(۲) ✓</span></p> <p>ب) <math>y_1 + y_1 = 3x_1^2 - 1 \xrightarrow{x_1 = x_2} y_1 + y_1 = y_2 + y_2 \Rightarrow y_1 - y_2 + y_1 - y_2 = 0 \Rightarrow (y_1 - y_2)(y_1 + y_2 + y_2 + 1) = 0 \Rightarrow (y_1 - y_2)(y_1 + 2y_2 + 1) = 0</math></p> <p><math>y_2 + y_2 = 3x_2^2 - 1</math></p> <div style="border: 1px solid black; padding: 5px; margin-top: 10px;"> <math display="block">\begin{cases} y_1 - y_2 = 0 \Rightarrow y_1 = y_2 &amp; \text{تابع است} \\ y_1 + y_1 + y_2 + y_2 + 1 = 0 \\ y_1 = \frac{-y_2 + \sqrt{\Delta}}{2} \rightarrow \Delta = y_2^2 - 4(y_2 + 1) = -3y_2^2 - 4 \\ \Rightarrow y_1 = \frac{-y_2 \pm \sqrt{-3y_2^2 - 4}}{2} \rightarrow \Delta &lt; 0 \end{cases}</math> </div> | ۱ |
| <p>الف) رسم شکل  <span style="color: red;">تابع است ✓</span></p> <p><math>\rightarrow) x \geq 0 \Rightarrow  y  \geq 1 \Rightarrow y \geq \pm 1</math></p> <p>ب) <math>y_1^3 + x_1^3 = 2x_1^2 - 1 \xrightarrow{x_1 = x_2} y_1^3 + x_2^3 = 2x_2^2 - 1 \Rightarrow y_1^3 + x_2^3 = 2x_2^2 - 1</math> <span style="color: red;">تابع است ✓</span> <span style="color: red;">(۲) ✓</span></p> <p>ج) <math>\sqrt[3]{y_1 + x_1^3} + \sqrt[3]{x_1} = 2x_1^2 - 1 \xrightarrow{x_1 = x_2} \sqrt[3]{y_1 + x_2^3} + \sqrt[3]{x_2} = 2x_2^2 - 1</math> <span style="color: red;">تابع است ✓</span></p>                                                                                                                                                                                                                                                    | ۲ |
| <p>الف) <math>\tan \frac{\pi}{4} = \frac{\frac{\sqrt{3}}{2}}{\frac{1}{2}} \Rightarrow \sqrt{3}</math></p> <p>ب) <math>\cot \frac{\sqrt{\pi}}{4} = \frac{-\frac{\sqrt{3}}{2}}{-\frac{1}{2}} = \sqrt{3}</math></p> <p>ج) <math>\tan 330 = \frac{-\frac{1}{2}}{\frac{\sqrt{3}}{2}} = -\sqrt{3}</math> <span style="color: red;">(۲) ✓</span></p> <p>د) <math>\cot 180 = \frac{-1}{0} = \text{تعریف نشده}</math><br/>جواب ندارد</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | ۳ |
| <p>الف) <math>\sin a = \frac{1}{4} \rightarrow 30^\circ, 150^\circ \rightarrow \left\{ 2k\pi + \frac{\pi}{6}, 2k\pi - \frac{\pi}{6} \right\}</math></p> <p><span style="color: red;">(۲) ✓</span></p> <p>ب) <math>\cos a = \frac{\sqrt{2}}{2} \rightarrow 45^\circ, 315^\circ \rightarrow \left\{ 2k\pi + \frac{\pi}{4}, 2k\pi - \frac{\pi}{4} \right\}</math></p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | ۴ |
| <p><math>y_2 y_1 + 1 \xrightarrow{x = -1} y = 0 \Rightarrow (-1, 0)</math></p> <p><math>y_2 x^2 \iff (-1, 1)</math></p> <p><math>y_2 - 2x + 4 \xrightarrow{x = 1} y = 2 \Rightarrow (1, 2)</math> <span style="color: red;">(۲) ✓</span></p> <div style="text-align: right;">  </div>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | ۵ |

$$y = -x - 1 \xrightarrow{x=0} y = -1 \quad (-1, 0) \times$$

$$y = x^2 \xrightarrow{x=0} y = 0 \Rightarrow (0, 0) \times \quad (-1, 1) \text{ و } (1, 1) \checkmark$$

$$y = -x + 3 \xrightarrow{x=1} y = 2 \Rightarrow (2, 1)$$

پایین ضلع بین



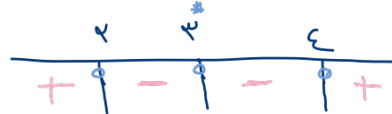
۶

$$\text{الف) } (x-2)(x-3)(x-4) = 0 \Rightarrow x = \{2, 3, 4\}$$



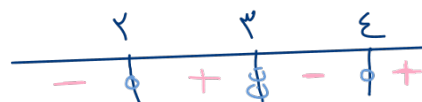
Ⓟ ✓

$$\rightarrow) (x-2)(x-3)(x-3)(x-4) = 0 \Rightarrow x = \{2, 3^*, 4\}$$



۷

$$\text{الف) } y = \frac{(x-2)(x-4)}{x-3}$$



$$\rightarrow) y = \frac{(x-2)(x-4)}{(x-3)(x-3)}$$

Ⓟ ✓



۸

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



1, 1.75 ✓

$$\rightarrow) \frac{(x-1)(x-2)}{(x-1)(x-3)}$$



۹

$$\text{الف) } \frac{x(x-1)(x+1)}{\text{مخرج ریشه ندارد}}$$



Ⓟ ✓

→) همیشه جواب این معادله + صورت و مخرج ریشه ندارند

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