

تابع است ✓ $11, 15$

$$\begin{aligned} (الف) \quad y_1^3 &= 2x_1^2 - 1 \\ y_2^3 &= 2x_2^2 - 1 \end{aligned} \xrightarrow{x_1=x_2} y_1^3 = y_2^3 \rightarrow y_1 = y_2$$

(ب) $y_1^3 + y_1 = 2x_1^2 - 1$
 $y_2^3 + y_2 = 2x_2^2 - 1$
 $\xrightarrow{x_1=x_2} y_1^3 + y_1 = y_2^3 + y_2 \rightarrow y_1^3 - y_2^3 + y_1 - y_2 = 0$

تابع است ✓ Δ جبر دوم منتهی است و بیشتر ندارد.

$$(y_1 - y_2)(y_1^2 + y_1 y_2 + y_2^2 + y_1 + y_2 + 1) = 0 \rightarrow y_1 - y_2 = 0 \rightarrow y_1 = y_2$$

(الف) شکل

(ب) تابع نیست $\lambda = \pm 1$ ✓

(ج) تابع است ✓ اثبات $y_1^3 = -x_1^3 + 2x_1 - 1 \rightarrow x_1 = x_2 \rightarrow y_1^3 = y_2^3 \rightarrow y_1 = y_2$
 $y_2^3 = -x_2^3 + 2x_2 - 1$

(د) اثبات تابع است ✓ $\sqrt[3]{y_1} = \sqrt[3]{-x_1^3 + 2x_1 - 1} \xrightarrow{x_1=x_2} \sqrt[3]{y_1} = \sqrt[3]{y_2} \rightarrow y_1 = y_2$
 $\sqrt[3]{y_2} = \sqrt[3]{-x_2^3 + 2x_2 - 1}$

(الف) $\frac{\sqrt[3]{x}}{x} = \sqrt[3]{x}$ (ب) $-\frac{\sqrt[3]{x}}{x} = \sqrt[3]{x}$ (ج) $-\frac{1}{\sqrt[3]{x}} = -\frac{1}{\sqrt[3]{x}} = \sqrt[3]{x}$
 (د) $\frac{1}{x} = \frac{1}{x}$ ✓

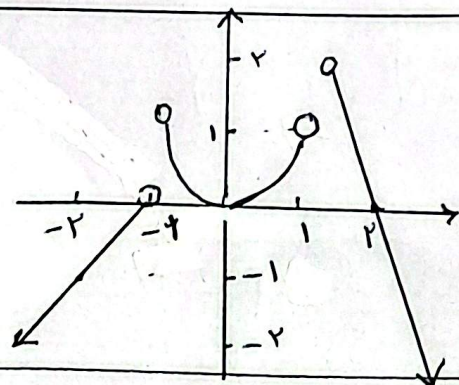
(الف) $q = \frac{\pi}{4}$ و $\frac{5\pi}{4}$

(ب) $q = \frac{\pi}{4}$ و $\frac{5\pi}{4}$ ✓

① $y = -2x + 4$
 $\begin{array}{r|rr} x & 0 & 2 \\ \hline y & 4 & 0 \end{array}$

③ $y = x + 1$
 $\begin{array}{r|rr} x & -1 & -2 \\ \hline y & 0 & -1 \end{array}$

④ $y = x^2$
 $\begin{array}{r|rr} x & -1 & 1 \\ \hline y & 1 & 1 \end{array}$



① $y = -x + 2$

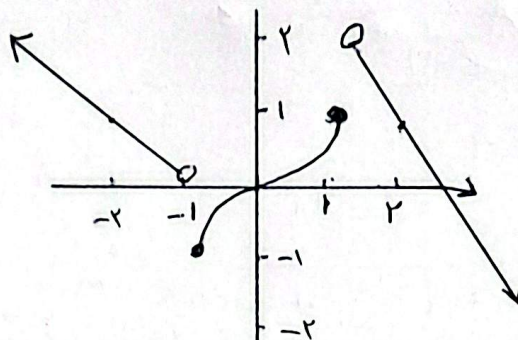
x	1	2
y	2	1

③ $y = -x - 1$

x	-1	-2
y	0	1

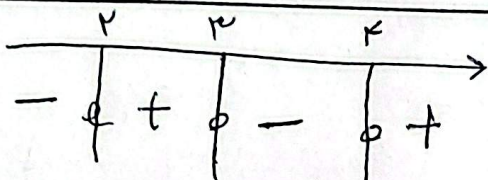
② $y = x^2$

x	-1	1
y	-1	1



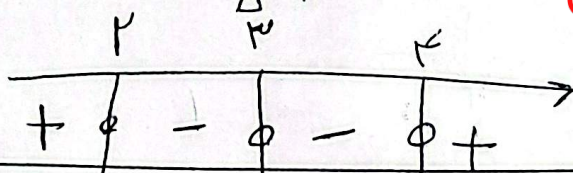
② ✓

الف)

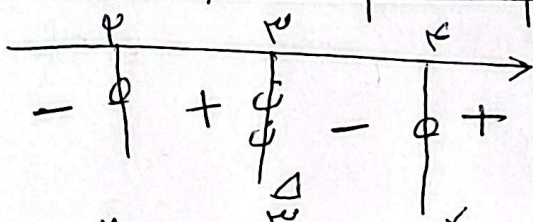


② ✓

ب)

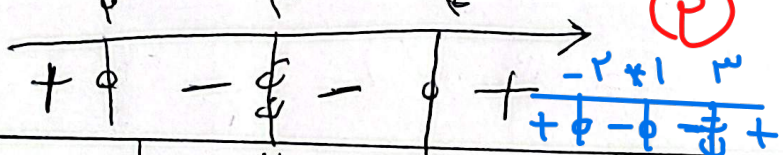


الف)

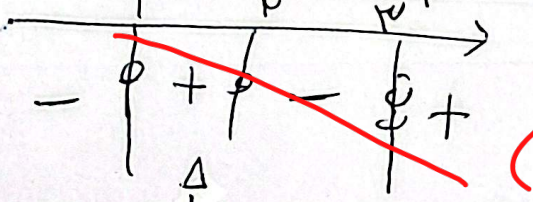


② ✓

ب)



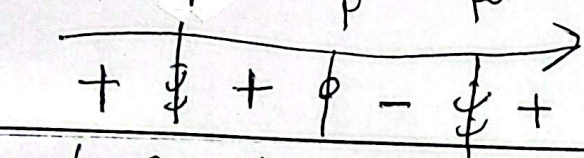
الف)



$$\frac{(x+2)(x-1)^2}{x-2} = 0$$

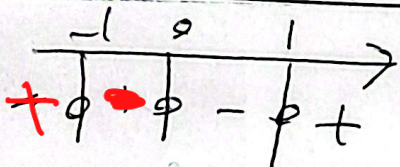
①

ب)



$$\frac{(x-2)(x-1)}{(x-2)(x-1)} = 0$$

الف)



$$x^2(x^2-1) = 0 \quad x^2(x-1)(x+1) = 0$$

$$x^2 + x + 2 = 0 \quad \Delta = 1 - 8 = -7$$

$$x^2 + 3x + 2 = 0 \quad \Delta = 9 - 4 = 5$$

$$x^2 + 2x + 2 = 0 \quad \Delta = 4 - 4 = 0$$

نم صورت و نم هم منفی است ندارد

است ندارد