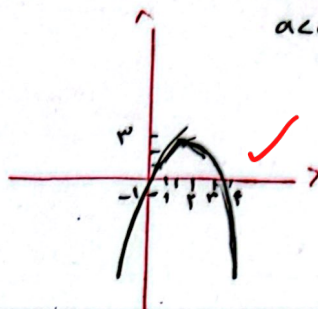
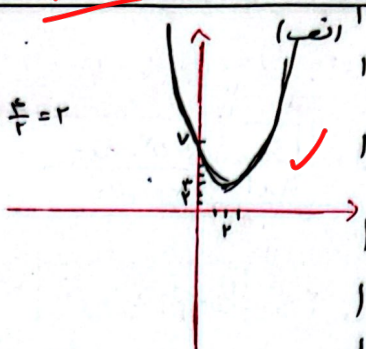


$$y = mx^2 - 4m + 1$$

$$a > 0 \Rightarrow \min, m_3 = -\frac{b}{2a} = \frac{4}{2} = 2$$

$$y_3 = 4 - 4 + 1 = 1$$

$$C = V$$



$$y = -mx^2 + 4m - 1 \quad (-)$$

$$a < 0 \Rightarrow \max, m_3 = -\frac{b}{2a} = \frac{-4}{-2} = 2$$

$$y_3 = -4 + 4 - 1 = -1$$

$$y = 2mx^2 + (m+1)x + \frac{1}{2}m + 2 = 0$$

$$\Delta > 0 \Rightarrow \Delta = b^2 - 4ac = (m+1)^2 - 4 \cdot 2 \cdot (\frac{1}{2}m + 2) > 0 \Rightarrow (m+1)^2 - 4m - 8 > 0$$

$$m^2 + 2m + 1 - 4m - 8 > 0 \Rightarrow m^2 - 2m - 7 > 0 \Rightarrow (m+3)(m-5) > 0$$

$$m > 5, m < -3 \quad \checkmark \quad m \in (-\infty, -3) \cup (5, +\infty)$$

$$\Delta = 0 \Rightarrow m^2 - 2m - 7 = 0 \Rightarrow m = -3, m = 5 \quad \checkmark \quad m \in \{-3, 5\}$$

$$\Delta < 0 \Rightarrow m^2 - 2m - 7 < 0 \Rightarrow -3 < m < 5 \quad \checkmark \quad m \in (-3, 5)$$

$$\Delta \geq 0 \Rightarrow m \leq -3, m \geq 5 \quad \checkmark \quad m \in (-\infty, -3] \cup [5, +\infty)$$

$$I = \Delta > 0$$

$$II = \Delta = 0$$

$$III = \Delta < 0$$

$$I = \Delta > 0 \Rightarrow m^2 - 2m - 7 > 0 \Rightarrow m \in \mathbb{R}$$

$$II = \Delta = 0 \Rightarrow m \in \{-3, 5\}$$

$$III = \Delta < 0 \Rightarrow m \in (-3, 5)$$

$$I \cap II \cap III = \emptyset$$

$$y = (m-2)x^2 - 2(m+1)x + 1$$

$$b = -2(m+1)$$

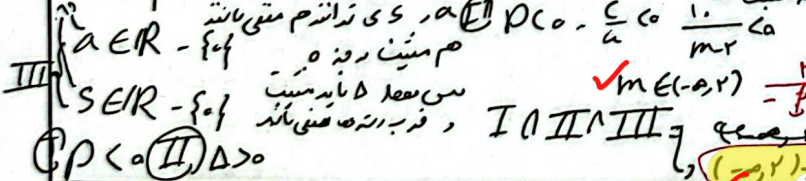
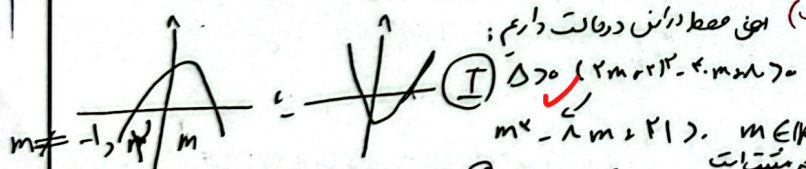
$$c = 1$$

$$a = (m-2)$$

$$\Delta > 0 \Rightarrow b^2 - 4ac > 0 \Rightarrow (-2(m+1))^2 - 4(m-2) > 0$$

$$\Delta < 0 \Rightarrow b^2 - 4ac < 0 \Rightarrow (-2(m+1))^2 - 4(m-2) < 0$$

$$\Delta = 0 \Rightarrow b^2 - 4ac = 0 \Rightarrow (-2(m+1))^2 - 4(m-2) = 0$$



$$m \neq -1, m \neq 1$$

$$a \in \mathbb{R} - \{-1, 1\}$$

$$S \in \mathbb{R} - \{0\}$$

$$P < 0 \Rightarrow \Delta > 0$$

$$m_3 = -2$$

$$-\frac{b}{2a} = -2 \Rightarrow \frac{b}{2a} = 2$$

$$b = 4a$$

$$-2(m+1) = 4(m-2)$$

$$-2m - 2 = 4m - 8$$

$$a = 4m - 4 \Rightarrow 4(m-1) = 0$$

$$m = 1 \quad \checkmark$$

$$\frac{2}{r} \sin^2 \alpha - (2 \sin \alpha + 1)m + \frac{5}{r} \geq 0 \Rightarrow (-2 \sin \alpha)^2 - (4)(\frac{2}{r} + \frac{1}{r}) \geq 0 \Rightarrow 4 \sin^2 \alpha - 4 \geq 0$$

$$\Delta \geq 0 \Rightarrow \sin^2 \alpha \geq 1 \Rightarrow \sin \alpha = 1 \text{ or } \sin \alpha = -1$$

$$\sin^2 \alpha = 1 \Rightarrow \sin \alpha = 1 \text{ or } \sin \alpha = -1$$

$$\sin \alpha = 1 \Rightarrow \frac{2}{r} m^2 - 2m + \frac{5}{r} = 0 \Rightarrow 4m^2 - 4m + 9 = 0 \Rightarrow m = \frac{1}{2} \quad \checkmark$$

$$\sin \alpha = -1 \Rightarrow \frac{2}{r} m^2 + 2m + \frac{5}{r} = 0 \Rightarrow 4m^2 + 4m + 9 = 0 \Rightarrow m = -\frac{1}{2} \quad \checkmark$$

۱۰) تابع را با خط $y=x$ قطع داده و $\Delta=0$ قرار می دهیم :

$$2x^2 + (m+1)x + m + 4 = x \rightarrow 2x^2 + mx + m + 4 = 0$$

$$\Delta=0 \rightarrow m^2 - 4(m+4) = 0 \rightarrow \begin{cases} m=12 \rightarrow \text{ناحیه سوم} \times \\ m=-4 \rightarrow \text{ناحیه اول} \checkmark \end{cases}$$

اتفاقاً تو این سوال به قیمت دیدن ای از بکشد به خط مماس شده!