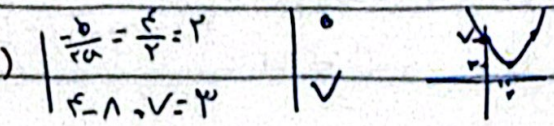
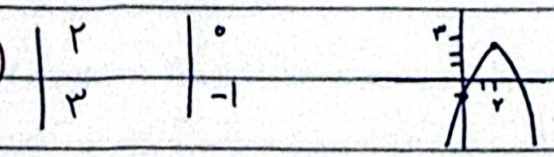
۱- الف) $\frac{-b}{2a} = \frac{4}{2} = 2$ , $f(2) = 4 - 8 + 7 = 3$



ب)



۲- الف) $\Delta > 0 \quad (m+1)^2 - 4(2)(\frac{1}{2}m+3) > 0$

$m^2 - 2m - 15 > 0$

$(m-5)(m+3) > 0$ , $(-\infty,-3) \cup (5,+\infty)$

ب) $\Delta = 0 \quad m^2 - 2m - 15 = 0$

$(m-5)(m+3) = 0$ , $m = 5, -3$

ج) $\Delta < 0 \quad (m-5)(m+3) < 0$ , $(-3,5)$

د) $\Delta \geq 0 \quad (m-5)(m+3) \geq 0$ , $(-\infty,-3] \cup [5,+\infty)$

۳- الف) $\Delta > 0 \rightarrow (2m+2)^2 - 4(m-2)(16) > 0 \quad m^2 - 8m + 21 > 0$ ✓

$S < 0 \rightarrow \frac{-b}{a} = \frac{2m+2}{m-2} < 0$ , $(-1,2)$

$P > 0 \rightarrow \frac{c}{a} = \frac{16}{m-2} > 0$ , $(2,+\infty)$

$\Rightarrow A \cap B = \emptyset$

ب) $\Delta > 0$ ✓

$S < 0 \rightarrow (-1,2)$

$P < 0 \rightarrow (-\infty,2)$

$\Rightarrow A \cap B \rightarrow (-1,2)$

۴- الف) $\Delta > 0 \Rightarrow m^2 - 8m + 24 > 0$ ✓

$p < 0 \Rightarrow (-\infty, 2)$

$S \neq 0 \Rightarrow m \neq -1$

$(-\infty, 2) - \{-1\}$

| $m-2>0$ | $m-2<0$ |
|---|---|
| $m>2$ | $m<2$ |
| ✗ | ✓ |

ب) $\frac{-b}{2a} = -2 \quad +b = +2a$

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

$2m+a = 4m-8$

$2m = 16 \quad (m=5)$

---

۵-

$\Delta = 0 \quad (2\sin\alpha)^2 - 4(\frac{2}{3})(\frac{3}{2}) = 0$

$4\sin^2\alpha - 4 = 0$

$\sin^2\alpha = 1 \quad \sin\alpha = \pm 1 \longrightarrow \frac{-b}{2a}$ $\begin{cases} \frac{3}{2} \text{ ✓} \\ -\frac{3}{2} \text{ ✗} \end{cases}$

چون $\Delta > 0$ ← غیرقابل قبول

$-1 < \sin\alpha < 1$

$\sin^2\alpha \geq 1 \rightarrow$ تساوی ←

---

۶- $y = \frac{(3x-2-1)(2x^2-3x-0)}{1-x^2} \rightarrow a+b+c=0 \Rightarrow x = -1, \frac{5}{2}$

$a+b+c=0$

$x=1, -\frac{1}{3}$

$\Rightarrow \frac{(x-1)(x+\frac{1}{3})(x-1)(x-\frac{5}{2})}{(x+1)(1-x)} = -(x+\frac{1}{3})(x-\frac{5}{2})$

$= -x^2 + \frac{13}{6}x + \frac{5}{6} \longrightarrow -6x^2 + 13x + 5 \quad \frac{-\Delta}{4a} = \frac{169}{24}$

---

۷- $3S + V = 5p \qquad S = \frac{m+2}{m} \qquad p = \frac{-2}{m}$

$\frac{3m+6}{m} + V = \frac{-10}{m}$

$3m + 6 + Vm = -10 \Rightarrow m = \frac{-2}{5} \Rightarrow S = 4, \; p = 5$

$\alpha^2 + \beta^2 = S^2 - 2p = 16 - 10 = 6$

piqio

$$\frac{\frac{\beta^2}{\alpha}}{\beta}$$

$$\frac{4\alpha \cdot \beta^0}{5\beta^2} = \frac{4\alpha}{5\beta^2} \cdot \frac{\beta^2}{\beta^2} \xrightarrow{4\beta=2 \Rightarrow \beta=\frac{2}{\alpha}} \frac{4\alpha}{5(\frac{2}{\alpha^2})} + \frac{\beta^2}{4} \quad -8$$

$$\frac{4\alpha^2}{20} + \frac{4\beta^2}{20} = \frac{\alpha^2+\beta^2}{5} = \frac{S^2-2P}{5} = \frac{120-20}{5} = 19$$

---

$$2x \cdot 10 = ax^2 + bx + c \quad -9$$

$$ax^2 + (b-2)x + c - 10 = 0 \quad c-10=4 \Rightarrow c=14$$

$$S = \frac{-b}{a} = 1 \Rightarrow -b = a$$

$$P = \frac{c-10}{a} = -6 \quad -6a = 4 \Rightarrow a = \frac{-2}{3} \Rightarrow b = \frac{2}{3}$$

$$\frac{-b}{2a} = \frac{\frac{-2}{3}}{\frac{-4}{3}} = 1$$

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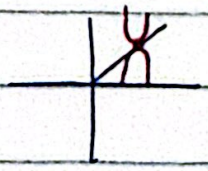

$$\frac{-b}{2a} = \frac{-\Delta}{4a} \Rightarrow +2b = b^2 - 4ac \quad -10$$

$$b^2 - 4ac - 2b = 0$$

$$m^2 + 10m - 4(2)(m+6) - 2(m+1) = 0$$

$$m^2 - 8m - 54 = 0 \begin{cases} 4-\sqrt{70} \\ 4+\sqrt{70} \end{cases}$$