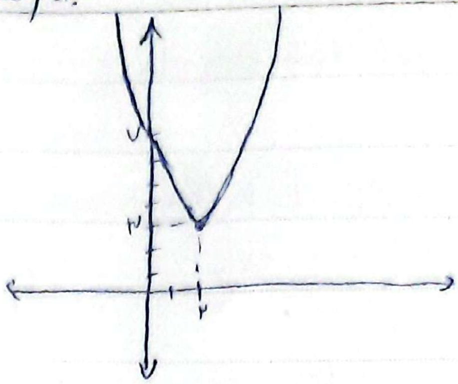
DATE: تطابق ریاضی SUB: بنام خدا

۱- الف) $y = x^2 - 4x + 7$

$x_s = \frac{4}{2} = 2$

$y_s = 4 - 8 + 7 = 3$

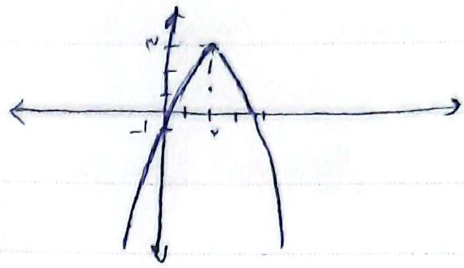


ب) $y = -x^2 + 4x - 1$

$x_s = \frac{-4}{-2} = 2$

$y_s = -4 + 8 - 1 = 3$

$\frac{-4 \pm \sqrt{16-4}}{-2} = 2 \pm \sqrt{3}$ $\approx 0{,}3$, $\approx 3{,}7$



۲- $2x^2 + (m+1)x + \frac{1}{2}m + 2 = 0$

الف) $\Delta > 0$ $\quad (m+1)^2 - 8\left(\frac{1}{2}m + 2\right) > 0 \quad m^2 + 2m + 1 - 4m - 16 > 0$

$m^2 - 2m - 15 > 0 \quad (m-5)(m+3) > 0$ $\quad \begin{array}{ccccc} & -3 & & 5 & \\ + & & - & & + \end{array} \rightarrow m \in (-\infty, -3) \cup (5, +\infty)$

ب) $\Delta = 0 \rightarrow (m-5)(m+3) = 0 \rightarrow m = -3, 5$

ج) $\Delta < 0 \rightarrow (m-5)(m+3) < 0$ $\quad \begin{array}{ccccc} & -3 & & 5 & \\ + & & - & & + \end{array} \rightarrow m \in (-3, 5)$

د) $\Delta \geq 0 \rightarrow (m-5)(m+3) \geq 0$ $\quad \begin{array}{ccccc} & -3 & & 5 & \\ + & & - & & + \end{array} \rightarrow m \in (-\infty, -3] \cup [5, +\infty)$

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۳- $y=(m-2)x^2-2(m+1)x+10$ $\quad m\neq 2 \leftarrow$ شرط

الف) $\Delta>0 \quad 4(m+1)^2-40(m-2)>0 \to m^2-8m+21>0$ ✓

$S<0 \quad \frac{2(m+1)}{m-2}<0 \quad \begin{array}{ccccc} & -1 & & 2 & \\ + & 0 & - & | & + \end{array} \to -1<m<2$

$P>0 \quad \frac{10}{m-2}>0 \to m>2$

$\xrightarrow{\cap} \varnothing$

ب) $\Delta>0 \to m^2-8m+21>0$ ✓

$S<0 \to \frac{2(m+1)}{m-2}<0 \to \begin{array}{ccccc} & -1 & & 2 & \\ + & 0 & - & | & + \end{array} \to -1<m<2$

$P<0 \quad \frac{10}{m-2}<0 \to m<2$

$\xrightarrow{\cap} (-1,2)$

۴- $y=(m-2)x^2-2(m+1)x+10$ $\quad m\neq 2 \leftarrow$ شرط

الف) $P<0 \to \frac{10}{m-2}<0 \to m<2 \to (-\infty,2)$

ب) $\frac{\cancel{2}(m+1)}{\cancel{2}(m-2)}=-2 \quad m+\cancel{1}=-2m+\cancel{4}^{\,3} \to m=1$

۵- $\frac{2}{3}x^2-2\sin\alpha\, x+\frac{3}{4}=0 \to \Delta\geq 0 \to 4\sin^2\alpha\geq 4 \to \sin\alpha=\pm 1$ غ ق ق

$\frac{2}{3}x^2-2x+\frac{3}{4}=0 \to \frac{2}{\frac{4}{3}}=\boxed{\frac{3}{2}}$

۶- $y=\frac{\overset{-1}{(x-1)}(3x+1)\,\cancel{(x+1)}(2x-5)}{\cancel{(1-x)}\cancel{(x+1)}} \xrightarrow{x\neq\pm1} y=-(3x+1)(2x-5)$

$y=-6x^2+13x+5 \quad x_s=\frac{-13}{-12}=\frac{13}{12} \quad y_s=\frac{-6\times 13^2}{144\times 12}+\frac{13\times 13}{12}+5=\frac{169}{24}+5=\frac{289}{24}$

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$3S = 5P + 7 \longrightarrow \frac{3(m+2)}{m} = \frac{-10}{m} + \frac{7m}{m}$ ـ۷

$\downarrow m \neq 0$

$\alpha^2 + \beta^2 = S^2 - 2P = ?$

$3\cancel{m} + 6 = -10 + 7\cancel{m} \longrightarrow m = 4$

$\left(-\frac{6}{4}\right)^2 - 2 \times \frac{-2}{4} = \frac{9}{4} + \frac{4}{4} = \boxed{\frac{13}{4}}$

$x^2 - 5x + 2 = 0 \qquad \frac{4\alpha + \beta^5}{5\beta^2} = \frac{4\alpha}{5\beta^2} + \frac{\beta^3}{5} = \frac{4\alpha}{5\alpha\left(\frac{2}{\alpha}\right)^2} + \frac{\beta^3}{5} = \frac{\alpha^3 + \beta^3}{5}$ ـ۸

$= \frac{(\alpha+\beta)(\alpha^2 - \alpha\beta + \beta^2)}{5} = \frac{S(S^2 - 3P)}{5} = \frac{5(25-6)}{5} = \boxed{19}$

$y_2 = 2x + 10 \longrightarrow \begin{vmatrix} 2 \\ 14 \end{vmatrix} \qquad \begin{vmatrix} -3 \\ 4 \end{vmatrix}$

$y_1 = ax^2 + bx + 4 \longrightarrow \begin{cases} 10 = (4a + 2b) \times \frac{3}{2} \to 15 = 6a + 3b \\ 0 = 9a - 3b \end{cases}$ ـ۹

$15a = 15 \to a = 1$

$b = 3$

$x^2 + 3x + 4 \to x_s = -\frac{b}{2a} = \boxed{\frac{-3}{2}}$

$2x^2 + (m+1)x + m + 6 = x \longrightarrow 2x^2 + mx + m + 6 = 0 \longrightarrow \Delta = 0$ ـ۱۰

$m^2 - 8(m+6) = 0 \to m^2 - 8m - 48 = 0 \to (m-12)(m+4) = 0 \longrightarrow m = 12, -4$

[illegible]

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