۲۰

Subject

Year . Mont . Day . ( ) مهسا فراغتی - دهم دختر - تکلیف ۲۴

① ۳

الف) $y = 2x^2 - 4x + 1 \qquad a>0$

$\frac{-b}{2a} = \frac{-(-4)}{2\times 2} = \frac{4}{4} = 1 \rightsquigarrow \boxed{\begin{vmatrix} 1 \\ -1 \end{vmatrix} = (1,-1)}$ min

$\frac{4ac-b^2}{4a} = \frac{4\times 2\times 1-(-4)^2}{4\times 2} = \frac{8-16}{8} = \frac{-8}{8} = -1$

ب) $y = -2x^2 + 3x - 5 \qquad a<0$

$\frac{-b}{2a} = \frac{-3}{2(-2)} = \frac{-3}{-4} = \frac{3}{4} \rightsquigarrow \boxed{\begin{vmatrix} \frac{3}{4} \\ -\frac{31}{8} \end{vmatrix} = (\frac{3}{4}, -\frac{31}{8})}$ max

$\frac{4ac-b^2}{4a} = \frac{4(-2)(-5)-3^2}{4(-2)} = \frac{40-9}{-8} = \frac{31}{-8}$

② ۳

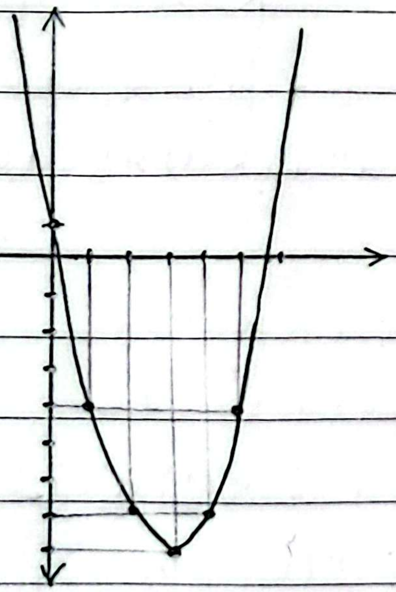
الف) $y = x^2 - 6x + 1$

$\frac{-b}{2a} = \frac{-(-6)}{2\times 1} = \frac{6}{2} = 3 \quad , \quad \frac{4ac-b^2}{4a} = \frac{4\times 1\times 1-(-6)^2}{4\times 1} = \frac{4-36}{4} = \frac{-32}{4} = -8$

$\rightarrow \begin{vmatrix} 3 \\ -8 \end{vmatrix} \qquad \Delta = b^2 - 4ac = 36 - 4\times 1\times 1 = 36-4 = 32$

$\frac{6 \pm 4\sqrt{2}}{2} = 3 \pm 2\sqrt{2} \simeq 3 \pm 2(1,4) = 3 \pm 2,8$ $\rightarrow 5,8$ ، $\rightarrow 0,2$

x	۱	۲	۳	۴	۵
y	-۴	-۷	-۸	-۷	-۴



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ب) $y = -x^2 + 4x + 1$

x	۱	۲	۳
y	۴	۵	۴

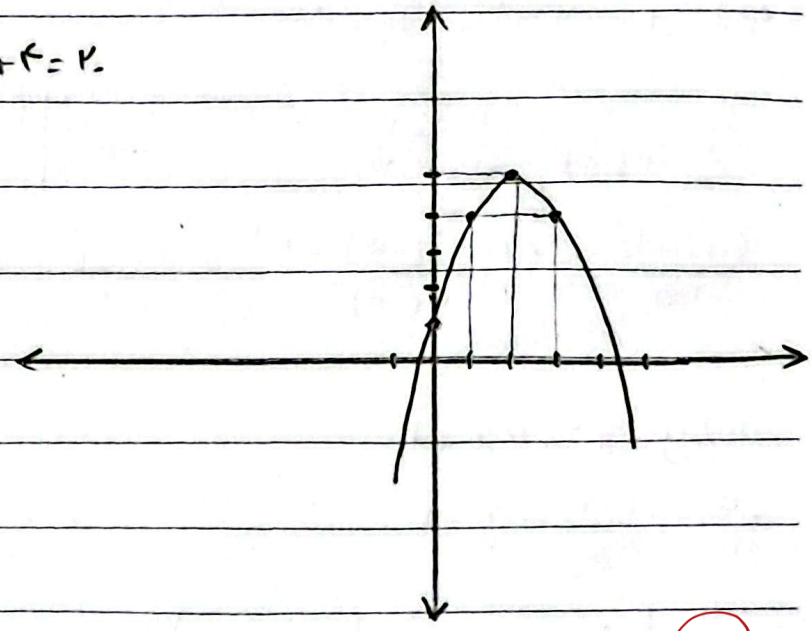
$\frac{-b}{2a} = \frac{-4}{2(-1)} = \frac{-4}{-2} = 2 \rightsquigarrow \begin{vmatrix} 2 \\ 5 \end{vmatrix}$

$\frac{4ac - b^2}{4a} = \frac{4(-1)\times 1 - 4^2}{4(-1)} = \frac{-4-16}{-4} = \frac{-20}{-4} = 5$

$b^2 - 4ac = 4^2 - 4(-1)\times 1 = 16 + 4 = 20$

$\frac{-4 \pm 2\sqrt{5}}{-2} = 2 \pm \sqrt{5}$

$\simeq 2 \pm (2,2) \rightsquigarrow 4,2$
$\hookrightarrow -0,2$



۳

$4x^3 + kx^2 - 9x - 2 = 0 \qquad \alpha + \beta = 1 \qquad k = ?$

$\alpha\beta = -2 \rightsquigarrow x^2 - x - 2 = 0$

$4x^3 + kx^2 - 9x - 2 = x^2 - x - 2 \rightsquigarrow 4x^3 + (k-1)x^2 - 8x = 0$

$\div x \rightsquigarrow 4x^2 + (k-1)x - 8 = 0$

$4x^2 + (k-1)x - 8 = x^2 - x - 2 \rightarrow 3x^2 + kx - 6 = 0$

$3x^2 + kx - 6 = x^2 - x - 2 \rightarrow 2x^2 + (k+1)x - 4 = 0$

$2x^2 + (k+1)x - 4 = x^2 - x - 2 \rightarrow x^2 + (k+2)x - 2 = 0$

$x^2 + (k+2)x - 2 = x^2 - x - 2 \rightsquigarrow (k+2)x = -x$

$k + 2 = -1 \rightarrow \boxed{k = -3}$

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۴) $x^2 - 3mx + m = 0$

$\sqrt{\alpha} - \sqrt{\beta} = 1 \rightsquigarrow (\sqrt{\alpha} - \sqrt{\beta})^2 = 1^2$

$\alpha + \beta - 2\sqrt{\alpha\beta} = 1$

$\alpha + \beta = \frac{-(-3m)}{1} = 3m$

$\alpha\beta = \frac{m}{1} = m$

$\rightsquigarrow 3m - 2\sqrt{m} = 1 \rightsquigarrow \sqrt{m} = x \rightsquigarrow x > 0$

$3x^2 - 2x - 1 = 0 \xrightarrow{\times 3} 9x^2 - 6x - 3 = 0$

$(3x - 3)(3x + 1) = 0 \rightsquigarrow \frac{3(x-1)(3x+1)}{3}$

$\rightsquigarrow (x-1)(3x+1) = 0 \rightsquigarrow x = 1$ ✓

$\hookrightarrow x = -\frac{1}{3}$ ×

$\rightsquigarrow \sqrt{m} = 1 \rightsquigarrow m = 1$

$2x^2 - mx - m = 0 \rightsquigarrow \frac{c}{a} = \frac{-m}{2} = \boxed{-\frac{1}{2}}$

۵) $\frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{b^2 - 4ac}}{|a|} = \frac{\sqrt{m^2 + 4 + 4m - 8m}}{2} = \frac{\sqrt{(m-2)^2}}{2} = \frac{m-2}{2}$

$m \times \frac{(m-2)}{2} \times \frac{1}{2} = \frac{m^2 - 2m}{4} = \frac{3}{4} \rightsquigarrow m^2 - 2m = 3$

$m^2 - 2m - 3 = 0 \rightsquigarrow (m-3)(m+1) = 0$

$\rightsquigarrow m = 3 \quad , \quad m = -1$

$y = x^2 - mx + 1 \rightsquigarrow xs = \frac{m}{2} \rightsquigarrow \frac{3}{2}$

$\hookrightarrow -\frac{1}{2}$

$\boxed{\frac{3}{2}} \quad \text{و} \quad \boxed{-\frac{1}{2}}$

$\frac{(2-m)}{2} \times \frac{m}{2} = \frac{2m - m^2}{4} = \frac{3}{4}$

$m^2 - 2m + 3 = 0$

ریشه ندارد ×

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⑥ (۲)

$y = ax^2 + 4x + a \rightsquigarrow \min \rightsquigarrow \cup \; a > 0$

$\frac{4ac - b^2}{4a} = \frac{4 \times a \times a - 9}{4a} = \frac{4a^2 - 9}{4a} = \frac{7}{8}$

$8a^2 - 18 = 7a \rightsquigarrow 8a^2 - 7a - 18 = 0$

$\overset{\times 8}{\rightsquigarrow} 64a^2 - 56a - 144 = 0$

$(8a - 16)(8a + 9) = 0 \rightsquigarrow \frac{8(a-2)(8a+9)}{8} = 0$

$\rightsquigarrow (a-2)(8a+9) = 0$

$\rightsquigarrow a = 2 \checkmark \rightsquigarrow \boxed{a = 2}$ یک مقدار a

$\hookrightarrow a = \frac{-9}{8} \times$

⑦ (۴)

$x^2 - (a+1)x + a = 0 \rightsquigarrow a$: ضرب

$\frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{a^2 + 1 + 2a - 4a}}{1} = \sqrt{a^2 + 1 - 2a} = \sqrt{(a-1)^2} = |a-1| = a-1$

↓ ضرایب ۳

$a - 1 = 2 \rightsquigarrow a = 3$

$x^2 - (3a+1)x + b = 0 \rightsquigarrow b$: ضرب

$x^2 - 10x + b = 0$

$\frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{\Delta}}{1} = \sqrt{\Delta} = \sqrt{100 - 4b} = 2 \rightsquigarrow \sqrt{100 - 4b} = \sqrt{4}$

$100 - 4b = 4 \rightsquigarrow 96 = 4b \rightsquigarrow b = 24$

$b - a = 24 - 3 = \boxed{21}$

۲ ⑧

$y = -ax^2 + ax + 2$

$\frac{-b}{2a} = \frac{-a}{2(-a)} = \frac{1}{2}$

$\frac{4ac - b^2}{4a} = \frac{4(-a)\times 2 - a^2}{4(-a)} = 2 + \frac{a}{4}$

$y = 2bx^2 - bx - 1$

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

$\frac{4ac - b^2}{4a} = \frac{4(2b)(-1) - (-b)^2}{4(2b)} = -1 - \frac{b}{8}$

$2 + \frac{a}{4} = \frac{1}{2}b - \frac{1}{2}b - 1 \rightsquigarrow 8 + a = -4 \rightsquigarrow a = -4 - 8 = -12$

$-1 - \frac{b}{8} = -\frac{1}{16}a + \frac{1}{4}a + 2 \rightsquigarrow -16 - 2b = -a + 4a + 32$

$-16 - 2b = 3a + 32 \rightarrow -2b = 3(-12) + 32 + 16$

$-2b = -36 + 48 = 12 \rightsquigarrow b = \frac{12}{-2} = -6 \rightsquigarrow b = -6$

$b - a = -6 - (-12) = -6 + 12 = \boxed{6}$

۲ ⑨

$y = 25\alpha x^2 + 4x + \beta$

$\frac{-4}{25\alpha} = \alpha + \beta \quad , \quad \frac{\beta}{25\alpha} = \alpha \cdot \beta \rightsquigarrow 25\alpha^2 = 1 \rightsquigarrow \alpha^2 = \frac{1}{25}$

$\alpha = \pm\frac{1}{5}$ ↳ $\alpha = \frac{1}{5} : \frac{-4}{25\times\frac{1}{5}} = \frac{1}{5} + \beta \rightsquigarrow \frac{-4}{5} = \frac{1 + 5\beta}{5}$

$\rightsquigarrow -4 = 1 + 5\beta \rightarrow 5\beta = -5 \rightsquigarrow \beta = -1 \rightsquigarrow \beta < \alpha$ X

$\rightsquigarrow \boxed{\alpha = -\frac{1}{5}} : \frac{-4}{25(-\frac{1}{5})} = -\frac{1}{5} + \beta \rightsquigarrow \frac{4}{5} = \frac{-1 + 5\beta}{5}$

$\rightsquigarrow 5\beta = 5 \rightsquigarrow \boxed{\beta = 1}$

ادامه صفحه بعد :

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$$\frac{-b}{2a} = \frac{-4}{50\alpha} = \frac{-4}{50(-\frac{1}{5})} = \frac{-4}{-10} = \frac{4}{10} \rightsquigarrow x_s > 0$$

$$\frac{4ac-b^2}{4a} = \frac{4(25\alpha)\beta - 14}{100\alpha} = \frac{4(25\times(-\frac{1}{5}))\times 1 - 14}{100(-\frac{1}{5})}$$

$$\frac{-20-14}{-20} = \frac{-34}{-20} = \frac{34}{20} \rightsquigarrow y_s > 0$$

$x_s > 0$, $y_s > 0$ $\rightsquigarrow$ ربع اول صفحات

(۲) (۱۰)

$$x^2 - (a^2+b^2-12)x + a + b - 1 = 0$$

$$\frac{a+b-1}{1} = ab \rightarrow a+b = ab+1$$

$$\frac{a^2+b^2-12}{1} = a+b \rightsquigarrow a^2+b^2-12 = a+b$$

$$(a+b)^2 = a^2+b^2+2ab$$

$$(ab+1)^2 = a^2b^2+1+2ab$$

$$a^2+b^2+2ab = a^2b^2+1+2ab$$

$$a^2b^2+1-12 = ab+1 \rightarrow a^2b^2-ab-12 = 0$$

$$(ab-4)(ab+3) = 0$$

$\hookrightarrow ab = 4$ ✓

$\hookrightarrow ab = -3$ ✗ $(ab > 0)$

$$a+b = ab+1 = 4+1 = 5 \rightsquigarrow \boxed{a+b=5}$$