Subject:
Date

تمرین اساسی

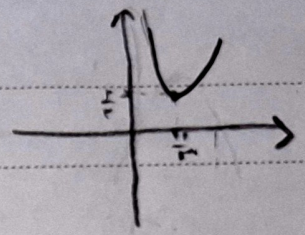
① از نواحی ۱ و ۲

$y = 3x^2 - 2x \quad x = \frac{-b}{2a} \rightarrow x = \frac{-2}{3\times 2} = +\frac{2}{6} = \frac{1}{3}$

$y = \frac{-\Delta}{4a} = \frac{-(-8)}{4\times 3} = \frac{8}{12} = \frac{2}{3}$

$\Delta = b^2 - 4ac \rightarrow (-2)^2 - 4(3\times 1) = -8$

رأس $(\frac{1}{3}, \frac{2}{3})$



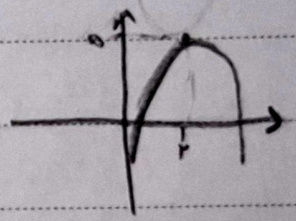
از نواحی ۱ و ۳ و ۴

$y = -x^2 + 4x \quad x = \frac{-b}{2a} \rightarrow x = \frac{-(4)}{-1\times 2} = \frac{-4}{-2} = 2$

$y = -\frac{\Delta}{4a} \rightarrow \frac{-20}{-1\times 8} = \frac{-20}{-4} = 5$

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

رأس $(2, 5)$



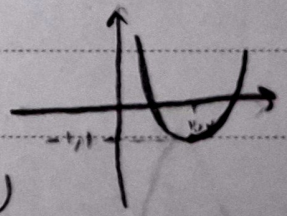
② از نواحی ۱ و ۲ و ۴

$y = 2x^2 - 5x + 2 \quad x = \frac{-b}{2a} \rightarrow \frac{-(-5)}{2\times 2} = \frac{+5}{4} = 1.2$

$y = -\frac{\Delta}{4a} = \frac{-9}{4\times 2} = \frac{-9}{8} \simeq -1.1$

$\Delta = b^2 - 4ac \rightarrow (-5)^2 - 4(2\times 2) = 9$

رأس $(1.2, -1.1)$



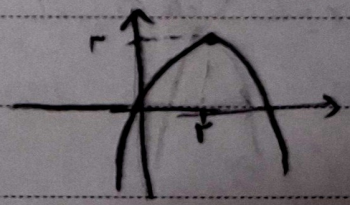
از نواحی ۱ و ۳ و ۴

$y = -x^2 + 4x - 1 \rightarrow x = \frac{-b}{2a} \rightarrow \frac{-4}{-2} = 2$

$y = -\frac{\Delta}{4a} = \frac{-12}{-4} = 3$

$\Delta = +b^2 - 4ac \rightarrow 16 - 4(-1\times -1) = 12$

رأس $(2, 3)$



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$x^2 - x - 3 = 0$ (3)

الف) $\frac{\alpha+\beta}{\alpha-\beta} = \alpha+\beta = -\frac{b}{a} = -\frac{-1}{1} = 1$

$\alpha-\beta = \frac{\sqrt{\Delta}}{|a|} = \Delta = b^2-4ac = (-1)^2 - 4(1)(-3) = 13 \Rightarrow \frac{1}{\sqrt{13}} \times \frac{\sqrt{13}}{\sqrt{13}} = \frac{\sqrt{13}}{13}$

$|a| = 1$

ب) $\alpha^2+\beta^2 = (\alpha+\beta)^2 - 2\alpha\beta = (1)^2 - 2(-3) = 7$

$\frac{c}{a} = \frac{-3}{1} = -3$

ج) $\alpha^3+\beta^3 = (\alpha+\beta)^3 - 3\alpha\beta(\alpha+\beta) = (1)^3 - 3(-3)(1) = 10$

د) $\alpha^3-\beta^3 = (\alpha-\beta)^3 + 3\alpha\beta(\alpha-\beta) = (\sqrt{13})^3 + 3(-3)(\sqrt{13}) = 13\sqrt{13} - 9\sqrt{13}$

(4) $y = (x-2)(x^2-ax+a)$ محور x ها را در یک نقطه قطع می‌کند. مجموع مقادیر a

$\Delta = 0$

$x^2-ax+a \rightarrow \Delta = b^2-4ac \rightarrow (-a)^2 - 4(a \times 1) = a^2 - 4a = ?$

$a^2 = 4a$

$a = 2\sqrt{a} \rightarrow a = 0$

(5) اگر α و β ریشه‌های معادله $3x^2-12x-a=0$ و $2\alpha^2+\beta^2-4\alpha = 7$ باشد، مقدار a چند برابر ریشه بزرگتر معادله است؟

$3x^2-12x-a=0 \rightarrow S = \frac{-b}{a} = \frac{12}{3} = 4$, $P = \frac{c}{a} = \frac{a}{3} \rightarrow a = 3P$

$2\alpha^2+\beta^2-4\alpha \rightarrow S = -\frac{b}{a} = -1$, $P = \frac{c}{a} \rightarrow \frac{-4}{2} = -2$

$3x^2 - 12x - 4(-1) = 0$

$(3x-1)(x-4) = 0$

$x = 4$

$3x-1=0$

$3x = 1$

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

۴ برابر

PAPCO

$a\alpha^2 - a\alpha - b = 0 \rightarrow S = -\frac{b}{a} \rightarrow -\frac{a}{a} = -1 \Big\} P = \frac{c}{a} \rightarrow \frac{b}{a}$ (۷)

$۲۵\beta^2 + ۲۵\alpha^2 - ۲۵\beta = ۱۷ \rightarrow \frac{-b}{a} = \frac{-(-۲۵)}{۲۵} = \frac{۱}{۲}$ / $P = \frac{c}{a} = \frac{-۱۷}{۲۵}$