نام و نام خانوادگی ..... پاسخنامه تشریحی تکلیف شماره ..... کلاس .....

۱

$y_s = \frac{-\Delta}{4a}$

$V = \frac{4ac - b^2}{4a} = \frac{-12 - b^2}{-4}$

$28 = 12 + b^2$

$b^2 = 16$

$b = \pm 4$

۲

الف) $f_{(x)} = x^4 + 2x^2 + 3$

$\xrightarrow[x^2 = t]{} t^2 + 2t + 3 = 0 \Rightarrow \Delta = 4 - 12 = -8 \Rightarrow \Delta < 0$ جواب ندارد

ب) $f_{(x)} = (4 - x^2)^2 - 2(4 - x^2) - 15$

$\xrightarrow[4 - x^2 = t]{} t^2 - 2t - 15 = 0 \Rightarrow (t+3)(t-5) = 0 \Rightarrow$

$t = -3 = 4 - x^2 \Rightarrow x^2 = 7 \Rightarrow x = \pm\sqrt{7}$ قبول

$t = 5 = 4 - x^2 \Rightarrow x^2 = -1$ ✗ غ ق ق

۳

$\alpha = \beta + 2 \quad \left(4x^2 - 16x + m = 0 \xrightarrow{\div 4} x^2 - 4x + \frac{m}{4} = 0\right)$

$\alpha - \beta = 2 = \frac{\sqrt{\Delta}}{|a|} = \frac{\sqrt{16 - m}}{1} \Rightarrow 16 - m = 4 \Rightarrow m = 12$

$x^2 - 4x + \frac{12}{4} = 0 \Rightarrow x^2 - 4x + 3 = 0$

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

$x = 1 \,/\, 3 \Rightarrow \alpha = 3 \,,\, \beta = 1$

۴

$2\alpha - \beta = 4$

$\alpha = \frac{4 + \beta}{2}$

$S = 2 = \alpha + \beta = \frac{4+\beta}{2} + \frac{2\beta}{2} = \frac{3\beta + 4}{2} \Rightarrow \beta = 0 \Rightarrow \alpha = 2$

$\xrightarrow[\text{معادله}]{} a x(x-2) = 0 \Rightarrow 3x(x-2) = 0$

$3x^2 - 6x = 0 \Rightarrow m - 1 = 0 \Rightarrow m = 1$

۵

$P = 1 \Rightarrow \frac{m^2 - 2}{-m} = 1 \Rightarrow m^2 - 2 + m = 0 \Rightarrow m = -2 \,/\, 1$

$\Delta > 0$

$16 - 4(-m)(m^2 - 4) > 0$

$4 + m(m^2 - 4) > 0$

$m^3 - 4m > -4 \Longrightarrow$

اگر $m = 1 \Rightarrow 1 - 2 > -4 \Rightarrow -1 > -4$ ✓ ق ق $m = 1$

اگر $m = -2 \Rightarrow -8 - (-2) > -4 \Rightarrow -4 > -4$ ✗ غ ق ق $m = -2$

۶ (۱٫۷۵)

$\alpha\beta^2 = 4$

$\alpha\beta = \frac{4}{\beta} = 3 \quad (P=3)$

$\beta = \frac{4}{3} \Rightarrow \alpha = \frac{9}{4}$

$S = m$

$\alpha + \beta = m$

$\frac{9}{4} + \frac{4}{3} = \frac{27+16}{12} = \frac{43}{12} = m$

$12x^2 - 43x + 3 \to \Delta > 0$ ✓

۷

$\alpha = 3\beta$

$S = 4$

$P = m \Rightarrow \alpha\beta = m \Rightarrow 3\beta \times \beta = m \Rightarrow 3\beta^2 = m$ (جایگذاری m و β در معادله)

$\beta^2 - 4\beta + 3\beta^2 = 0$

$4\beta^2 - 4\beta = 0$

$4\beta(\beta - 1) = 0$

$\beta = 0 \Rightarrow \alpha = 0$ غ ق ق

$\beta = 1$ ق ق (۲)

$m = 3\beta^2 = 3 \times 1^2 = 3$

$x^2 - 4x + 3 \to \Delta > 0$ ✓

$x^2 - 4x + 3\beta^2 = 0$

$x(x-4) = 0$

$x = 0 \,/\, 4$

۸ (۲)

$P = 2 \quad S = 7$

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

$\alpha^3 + \frac{8}{\alpha^3} = \left(\alpha + \frac{2}{\alpha}\right)^3 - 3 \times 2\left(\alpha + \frac{2}{\alpha}\right) = (\alpha+\beta)^3 - 6(\alpha+\beta) = 7^3 - 6 \times 7 = 7(49-6)$

$= 7 \times 43 = 301$

۹ (۲)

ارتفاع ماکسیمم $= y_s = \frac{-\Delta}{4a} = \frac{4a \cdot 0 - b^2}{4a} = \frac{-b^2}{4a} = \frac{-2500}{-40} = 62/5$

زمانی که توپ به زمین برخورد می‌کند: $-5t^2 + 50t = 0$

$t^2 - 10t = 0$

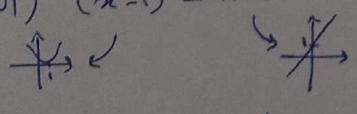
$t(t-10) = 0$

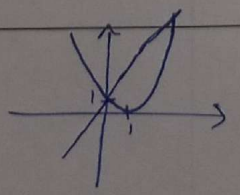
$t = 0$ لحظه شروع حرکت

$t = 10$ زمان برخورد مجدد به زمین

۱۰ (۲)

الف) $(x-1)^2 = 2x+1$ $\Rightarrow$





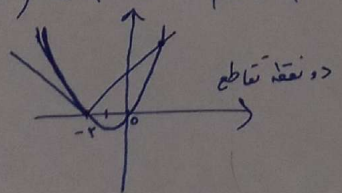
دو نقطه تماطع

$x^2 - 2x + 1 = 2x + 1$

$x^2 - 4x = 0$

$x = 0 \,/\, 4$ (۲)

ب) $x^2 + 2x = |x+2|$



دو نقطه تماطع

① $x^2 + 2x = x + 2 \Rightarrow x^2 + x - 2 = 0 \Rightarrow$ $x_1 = -2$ ق ق $(4 - 4 = |-2+2|$ ✓$)$

$x_2 = 1$ ق ق $(1 + 2 = |1+2|$ ✓$)$

② $x^2 + 2x = -x - 2 \Rightarrow x^2 + 3x + 2 = 0 \Rightarrow$ $x_1 = -1$ غ ق ق $(-1 - 2 = |-1|$ عبارت نادرست$)$

$x_2 = -2$ ق ق (مضاعف) (به‌دلیل قدر تعادله نامنفی‌ست)