آزمون ریاضی

۱۴,۵

۱)

$-x^2+bx+3$ $\qquad \frac{-b}{-2}=$

$\frac{-\Delta}{4a}=7 \qquad -\left(b^2-4(-1)(3)\right)=-b^2-12$

b^2+12

$\frac{b^2+12}{-4}=7 \qquad -b^2-12=-28 \qquad \frac{-28}{-12}{16}$

$16=b^2$

$b=\pm 4$

۲

۲)

الف) $f(x)=-x^4+2x^2+3$

$x^2=t \qquad t^2-2t+3=0 \longrightarrow \Delta<0$ ریشه ندارد

۲

ب) $f(x)=(4-x^2)^2-2(4-x^2)-15$

$t^2-2t-15=0 \qquad 4-x^2=5 \to -1=x^2$ ✗

$(t-5)(t+3)=0 \qquad 4-x^2=-3 \longrightarrow 7=x^2$

$x=\pm\sqrt{7}$

۳)

$2\alpha+2=4 \to \alpha=1 \qquad \begin{cases}\alpha=1\\ \alpha+2=3\end{cases} \qquad \beta=\frac{m}{4}=3\times 1 \to m=12 \qquad 4x^2-16x+12= \quad \Delta>0$ ✓

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$4x^2-16x+m=0 \qquad \beta=\alpha+2 \qquad \beta=4$

$\alpha+\beta=4 \qquad \alpha+2+\alpha$

$\alpha\cdot\beta=\frac{m}{4} \qquad 2\alpha+2=4$

$2\alpha=2$

$4\times 2=\frac{m}{4} \to m=32 \qquad \alpha=2$

۴)

۱,۲۵

$3x^2-6x+m-1=0 \qquad 2\alpha-\beta=4$

$\beta=2\alpha-4 \qquad m-1=0 \to m=1$

$2\alpha-4+\alpha=\frac{6}{3}=2 \qquad \to m=0$

$3x^2-6x=0 \quad \Delta>0$ ✓

$3\alpha=\frac{4+2}{6}$

$\alpha=2 \longrightarrow \beta=0$

۵)

$-mx^2+4x+m^2-2=0$

$\frac{m^2-2}{-m}=1$

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

$\alpha\cdot\beta=1$

$\frac{1}{\beta}\times\beta$

$m^2-2+m=0$

$(m+2)(m-1)=0$ → $\boxed{m=1}$ ، $m=-2$ غ ق ق

۲

$-x^2+4x-1=0$ → $16-4(-1)(-1)>0$ ✓ $\Delta>0$

$2x^2+4x+2=0$

$x^2+2x+1=0$ → $\Delta<0$ ✗

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۶)

۱٫۷۵

$x^2-mx+3=0$

$m=\frac{2}{\sqrt{\alpha}}+\alpha$

$\alpha\times\frac{2}{\sqrt{\alpha}}=3$

$\frac{2\alpha}{\sqrt{\alpha}}=3$

$\frac{\frac{3}{2}}{\frac{\sqrt{3}}{2}}$

$\alpha\cdot\beta^2=4$

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

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

$2\alpha=3\sqrt{\alpha}$

$4\alpha^2=9\alpha$, $\alpha=\frac{9}{4}$

$4\alpha=9$

$\frac{2}{\frac{3}{2}}+\frac{9}{4}$

$\frac{4}{3}+\frac{9}{4}$

$\Rightarrow m=\frac{16+27}{12}=\frac{43}{12}$

$x^2-\frac{43}{12}x+3 \to \Delta>0$ ✓

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۷)

۱٫۵

$x^2-4x+m=0$

$\beta=3\alpha$

$\beta=3$

$3\alpha+\alpha=4$, $\alpha=1$, $3\times1=$

$4\alpha=4$

$P=m\to\alpha\cdot\beta=3=m$

$x^2-4x+3\to\Delta>0$ ✓

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۸)

۲

$\frac{1}{\alpha}=\frac{7-\alpha}{2}\Rightarrow\frac{2}{\alpha}=7-\alpha$

$\alpha^3+\frac{8}{\alpha^3}$, $x^2-7x+2=0$, $\alpha+\frac{2}{\alpha}=\alpha+(7-\alpha)=7$

$\alpha^3+(\frac{2}{\alpha})^3=(\alpha+\frac{2}{\alpha})^3-3\alpha\cdot\frac{2}{\alpha}\cdot(\alpha+\frac{2}{\alpha})=7^3-6\times7=\boxed{301}$

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۹)

۱

$\frac{+50}{+10\times2}=x\to\boxed{2,5}\to$ زمان

$-10t(t-5)=0$

$t=0$ ✗

$t=5$ ✓

$y_{max}=-10\times2.5\times2.5+50\times2.5=\boxed{+62.5}$ ارتفاع

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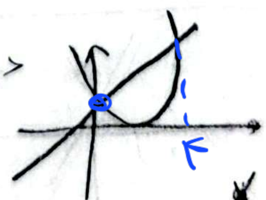
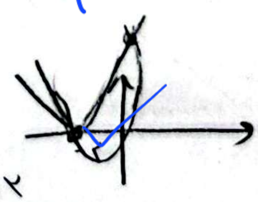
۱۰)

الف) $(x-1)^2=2x+1$



ب) $x^2+2x=|x+2|$



$x^2+2x=x+2$

$x^2+x-2=0$

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$(x+2)(x-1)=0$

-2 ، 1