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$$y = -u^2 + bu + 3 \Rightarrow -\frac{b}{4u} = -\frac{b}{-4} = \frac{b}{4} \Rightarrow (-\frac{b}{4})^2 + b(\frac{b}{4}) + 3 = 7 \Rightarrow -\frac{b^2}{4} + \frac{b^2}{4} = 4$$

$$\Rightarrow \frac{b^2}{4} = 4 \Rightarrow b^2 = 16 \Rightarrow b = \pm 4$$

$$b = 4 \Rightarrow -u^2 + 4u + 3 \Rightarrow -\frac{b}{4u} = 1 \Rightarrow -4 + 4 + 3 = 7$$

$$b = -4 \Rightarrow -u^2 - 4u + 3 \Rightarrow -\frac{b}{4u} = -1 \Rightarrow -4 + 4 + 3 = 7$$

$$b = \pm 4$$

(2)

$$الف) f(u) = u^2 + 2u + 3 \Rightarrow u = t \Rightarrow t^2 + 2t + 3 = 0 \Rightarrow \Delta = 4 - 12 = -8 < 0$$

بدون جواب می باشد

$$ب) f(u) = (4 - u^2)^2 - 2(4 - u^2) - 12 \Rightarrow 4 - u^2 = t \Rightarrow t^2 - 2t - 12 = 0$$

$$\Rightarrow (t - 4)(t + 3) \Rightarrow t = 4 \quad t = -3 \Rightarrow 4 - u^2 = 4 \Rightarrow u^2 + 1 = 0 \Rightarrow \text{بدون جواب}$$

$$4 - u^2 = -3 \Rightarrow u^2 - 7 = 0 \Rightarrow (u - \sqrt{7})(u + \sqrt{7})$$

$$u = \sqrt{7} \quad u = -\sqrt{7}$$

(2)

$$Eu^2 - 14u + m = 0 \Rightarrow \alpha \neq \beta \Rightarrow \beta = \alpha + 2 \Rightarrow \alpha + \beta = 2\alpha + 2 = -\frac{b}{a} = 4 \Rightarrow \alpha + 2 = 4$$

$$\Rightarrow \alpha = 2 \Rightarrow \boxed{\alpha = 1} \quad \beta = \alpha + 2 \Rightarrow \boxed{\beta = 3} \Rightarrow \alpha = 1 \Rightarrow E(1)^2 - 14(1) + m = 0 \Rightarrow -1 + m = 0$$

$$\Rightarrow m = 1$$

(2)

$$2u^2 - 4u + m - 1 = 0 \Rightarrow \alpha - \beta = 4 \Rightarrow \beta = \alpha - 4 \Rightarrow \alpha = \alpha \Rightarrow 2\alpha^2 - 4\alpha + m - 1 = 0 \quad \alpha = \beta \Rightarrow \alpha - \alpha - 4 = 0$$

$$\Rightarrow 2(\alpha - 4)^2 - 4(\alpha - 4) + m - 1 = 0 \Rightarrow 2(\alpha^2 - 8\alpha + 16) - 4\alpha + 16 + m - 1 = 0 \Rightarrow 2\alpha^2 - 16\alpha + 32 - 4\alpha + 16 + m - 1 = 0$$

$$\Rightarrow 2\alpha^2 - 20\alpha + 47 + m - 1 = 0 \Rightarrow \begin{cases} 2\alpha^2 - 20\alpha + 47 + m - 1 = 0 \\ 2\alpha^2 - 4\alpha + m - 1 = 0 \end{cases} \Rightarrow 16\alpha - 46 = 0 \Rightarrow \alpha = \frac{23}{8}$$

$$\Rightarrow (\alpha - 4)(\alpha - 2) = 0 \Rightarrow \alpha = 4 \quad \alpha = 2 \Rightarrow \frac{b}{a} = -\frac{b}{a} \Rightarrow +\frac{4}{2} = 2 \Rightarrow \alpha = 4 \Rightarrow \beta = -2 \Rightarrow \text{اما رابطه مستقیم نیست}$$

$$\Rightarrow \beta = 0 \Rightarrow \alpha = 0 \Rightarrow m - 1 = 0 \Rightarrow m = 1$$

(2)

$$-mu^2 + 4u + m^2 - 2 = 0 \Rightarrow \beta = \frac{1}{\alpha} \Rightarrow \frac{1}{\alpha} + \alpha = 1 \Rightarrow \frac{c}{a} = 1 \Rightarrow \frac{m^2 - 2}{-m} = 1 \Rightarrow m^2 - 2 = -m$$

$$\Rightarrow m^2 + m - 2 = 0 \Rightarrow (m + 2)(m - 1) = 0 \Rightarrow m = -2 \quad m = 1$$

$$\Delta = 0$$

(1, 175)

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$$\alpha\beta^2 = \epsilon \Rightarrow \beta = \frac{\epsilon}{\alpha} \Rightarrow \frac{\epsilon}{\alpha} = \frac{\epsilon}{\beta} \Rightarrow \alpha = \beta \Rightarrow \alpha = \frac{\epsilon}{\beta} \Rightarrow \alpha\beta = \epsilon \Rightarrow \beta = \frac{\epsilon}{\alpha} \quad \alpha = \frac{\epsilon}{\epsilon}$$

$$u = \frac{\epsilon}{\psi} \Rightarrow u^2 - mu + \psi = 0 \Rightarrow \left(\frac{\epsilon}{\psi}\right)^2 - m\left(\frac{\epsilon}{\psi}\right) + \psi = 0 \Rightarrow \frac{14}{9} - \frac{1\epsilon}{9}m + \frac{\psi}{9} = 0 \Rightarrow \frac{\epsilon\psi}{9} = \frac{1\psi}{9}m$$

$$\Rightarrow m = \frac{\epsilon\psi}{\psi} \times \frac{9}{1\psi} \Rightarrow m = \frac{\epsilon\psi}{1\psi} \checkmark$$

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$$\alpha \neq \beta \Rightarrow u^2 - \epsilon u + m = 0 \Rightarrow \beta = \psi \alpha \Rightarrow \alpha + \beta = \alpha + \psi \alpha = \epsilon \alpha \Rightarrow \alpha = 1 \quad \beta = \psi$$

$$\Rightarrow (u-1)(u-\psi) \Rightarrow m = \psi \checkmark$$

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$$\alpha + \beta = u, \quad \alpha\beta = \psi \Rightarrow \frac{1}{\alpha} = \frac{\beta}{\psi} \Rightarrow \frac{1}{\alpha^2} = \frac{\beta}{\alpha} \Rightarrow \alpha^2 + \frac{1}{\psi} \Rightarrow (\psi + \beta)^2 - \psi(\psi + \beta)$$

$$\Rightarrow \psi^2 - \psi(\psi)(\psi) = \psi\epsilon\psi - \epsilon\psi = \boxed{\psi\epsilon\psi} \checkmark$$

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$$h(t) = -\omega t^2 + \omega_0 t \Rightarrow t(-\omega t + \omega_0) = 0 \Rightarrow t = 0 \quad t = d \checkmark$$

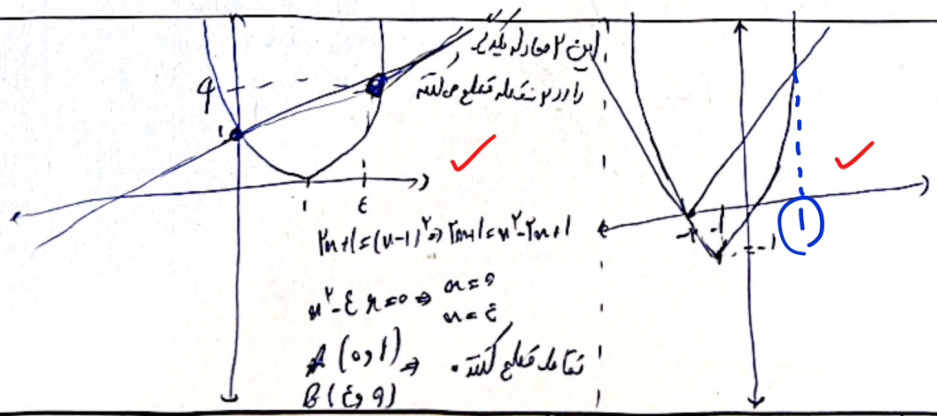
زمان برخورد به زمین

$$\frac{-b}{2a} \Rightarrow \frac{-\omega_0}{-2\omega} \Rightarrow \psi/d \Rightarrow u = \psi/d$$

$$\Rightarrow -\omega(\psi/d) + \omega_0(\psi/d) = -\omega\psi/d + \omega\psi/d = 0 \checkmark$$

کار به ارتفاع صاف

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$$u^2 - u = |u+2|$$

$$u^2 - u = u+2 \Rightarrow u^2 - 2u - 2 = 0 \Rightarrow u = 1 \checkmark$$

$$u^2 - u = -u-2 \Rightarrow u^2 = -2 \Rightarrow u = \pm i\sqrt{2}$$

$$\Rightarrow (u+2)/(u-1)$$

$$u = -1 \quad u = -2$$

$$\alpha$$

$$u < -2$$

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این دو گراف را در نظر بگیرید. در گراف سمت چپ، یک سهمی و یک خط مستقیم با هم برخورد می‌کنند. نقاط برخورد به ترتیب A(0,1) و B(ε,9) هستند. در گراف سمت راست، یک سهمی و یک خط مستقیم با هم برخورد می‌کنند. نقاط برخورد به ترتیب A(-1, -1) و B(1, 1) هستند.