

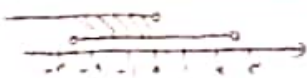
$$x = 2 \Rightarrow \frac{-b}{2a} = 2 \Rightarrow \frac{-(-1)}{2 \cdot 1} = 2 \Rightarrow \frac{1}{2} = 2 \Rightarrow 1 = 4 \Rightarrow 0 = -2^2 + 2 \cdot 2 + 1$$

$$y = -2^2 + 2 \cdot 2 + 1 = -4 + 4 + 1 = 1$$

$$0 = -2^2 + 2 \cdot 2 + 1$$

✓ (۲) ۱
طول موج

$$f(x) = kx^2 - \Delta x + m$$



$$1 \Rightarrow (-\frac{5}{2}, 0) \checkmark$$

(۲) ۲ جواب دارد

$$f(x) = \frac{x^2}{2} - \frac{5x}{2} + \frac{1}{2} \Rightarrow m < 0 \Rightarrow \Delta > 0 \Rightarrow 25 - 4 > 0$$

$$25 > 4 \Rightarrow \frac{25}{2} > m^2 \Rightarrow -\frac{5}{2} < m < \frac{5}{2}$$

$$\frac{5-\sqrt{5}}{2} \text{ و } \frac{5+\sqrt{5}}{2}$$

$$\Rightarrow y = x^2 - 2x + \frac{4}{9} = 9 - y = 9x^2 - 18x + 4$$

(۲) ۳ ✓

$$S = \frac{x^2 - \sqrt{5}x - x^2 + \sqrt{5}x}{2} = \frac{4}{2} = 2$$

$$P = \frac{x^2 - \sqrt{5}x}{2} \times \frac{x^2 - \sqrt{5}x}{2} = \frac{9-5}{9} = \frac{4}{9}$$

$$x^2 - 11x + m + 2 = 0$$

$$\alpha < \beta$$

$$\frac{x^2}{\alpha^2} \cdot \beta^2 = 12 \Rightarrow \frac{x^2}{\alpha^2} \cdot \frac{1}{\alpha^2} = 12 \Rightarrow \frac{1}{\alpha^4} = 12 \Rightarrow \alpha^4 = \frac{1}{12}$$

(۲) ۴

$$x^2 = 11x - m - 2$$

$$11\alpha - m - 2 + 14 - m - 2 = 12$$

$$S = -\frac{-11}{2} = \frac{11}{2}$$

$$11\alpha - 2m = 0$$

$$P = \frac{m+2}{2}$$

$$11\alpha = 2m$$

$$x^2 - 11x + 5x + 2 = 0$$

$$x^2 - 6x + 2 = 0$$

$$6\alpha = m$$

$$\alpha^2 - 2\alpha + 1 = 0$$

$$(\alpha - 1)^2 = 0 \Rightarrow \alpha = 1 \Rightarrow m = 6 \checkmark$$

$$S = (2, 9)$$

(۲) ۵

$$y = a(x-2)^2 + 9 \Rightarrow \text{فرار برابر} = 0 \Rightarrow a(0-2)^2 + 9 = 0 \Rightarrow 4a + 9 = 0$$

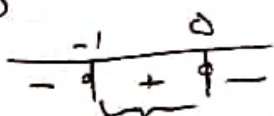
$$a = -\frac{9}{4}$$

$$y = ax^2 - 4ax + 4a + 9 = 0$$

$$y = -2x^2 + 4x - 9 + 9 = -2x^2 + 4x = -(x^2 - 2x)$$

$$(x-0)(x-2)$$

$$a < 0 \Rightarrow$$



$$\hookrightarrow (-1, 5) \checkmark$$

$$\alpha^2 - V\alpha + 9B = 0 \quad \frac{1}{\alpha} + \frac{1}{B} = \frac{\alpha+B}{\alpha B} = \frac{-V}{-2} = \frac{V}{2} \quad \checkmark \quad (2)$$

$$\alpha, B \neq 0 \quad \alpha^2 - V\alpha + 9B = 0$$

$$B > 0$$

$$\alpha B^2 - VB + 9B = 0 \quad \alpha B^2 + 2B = 0$$

$$S = ? = \frac{V}{\alpha}$$

$$B(\alpha B + 2) = 0 \quad B \neq 0 \Rightarrow \alpha B = -2$$

$$P = \frac{9B}{\alpha}$$

$$\alpha^2 - V\alpha + 9B = \alpha B^2 - VB + 9B$$

$$\alpha + B = -\frac{2}{\alpha} + \frac{1}{\alpha} = -\frac{1}{\alpha} \Rightarrow \alpha = -\frac{1}{\alpha + B}$$

$$\alpha(\alpha^2 - B^2) = V(\alpha - B) \quad \alpha(\alpha + B) = V$$

$$\text{if } \alpha = 2$$

$$(\alpha + B)(\alpha - B)$$

$$\alpha^2 + \alpha B = V \quad \alpha^2 = 9$$

$$2^2 - V \cdot 2 + 9B = 0 \xrightarrow{B} 4B^2 - VB + 9B = 0$$

$$\alpha = \pm 3 \Rightarrow \alpha = -3$$

$$\text{if } \alpha = -3$$

$$(-3)^2 - V(-3) + 9B = 0 \quad B(9B + 3) = 0 \quad B = 0 \text{ or } B = -\frac{1}{3} \text{ (not possible since } B > 0)$$

$$-3^2 - V(-3) + 9B = 0 \xrightarrow{B} -9B^2 - VB + 9B = 0 \quad -9B^2 + 3B = 0 \quad B(-9B + 3) = 0$$

$$\Rightarrow B = \frac{1}{3} \quad \checkmark$$

$$2^2 + m \cdot 2 - 14m = 0$$

$$\alpha, B \neq 0$$

$$S = \alpha + B = -m$$

$$P = \alpha B = -14m$$

$$\frac{-V}{-2} = \frac{-14}{-2} = 7 \quad (2)$$

$$2^2 + m \cdot 2 - 14m = 0 \quad B^2 + mB - 14m = 0 \Rightarrow \alpha^2 = -m \cdot 2 + 14m$$

$$\alpha^2 - mB = 14$$

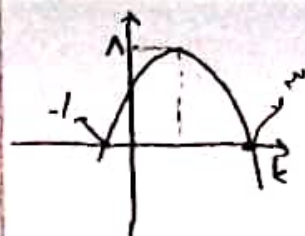
$$-m \cdot 2 + 14m - mB = 14 \quad -m(2 + B) + 14m = 14 \quad m^2 + 2m = 14 \quad m^2 + 2m - 14 = 0$$

$$(m+8)(m-6) = 0 \Rightarrow m = -8 \text{ or } m = 6$$

$$\text{if } m = -8 \quad \Delta = 14 - 14 < 0 \quad \times$$

$$\text{if } m = 6 \quad \Delta = 14 + 14 > 0 \quad \checkmark \Rightarrow m = 6 \quad \checkmark$$

$$S = -m = -6$$



$$f(x) = mx^2 + 2x + \frac{m}{2} + V$$

$$\max \left| \frac{-\frac{2}{m}}{-\frac{2}{m}} \right| = \frac{-(14 - 2m^2 - 2m)}{2m} = 14 \quad (2)$$

$$\alpha < 0 \Rightarrow x_1 < 0 \quad x_2 < 0$$

$$P < 0 \Rightarrow m \cdot k < 0 \quad m < -14$$

$$\Delta > 0 \Rightarrow 14 - (2m^2 + 2m) > 0$$

$$14 - 2m^2 - 2m > 0$$

$$14 - m^2 - 14m > 0$$

$$14m^2 + 28m - 14 < 0$$

$$m^2 + 7m - 1 < 0$$

$$(m-1)(m+8) < 0$$

$$f(x) = -x^2 + 2x + 14$$

$$-x^2 + 2x + 14$$

$$-(x^2 - 2x - 14)$$

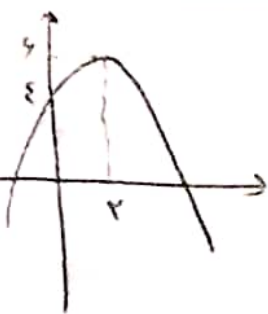
$$(2-x)(x+1)$$

$$\odot$$

$$\odot$$

$$\checkmark \Delta > 0 \quad k = 2 \quad \checkmark$$

$$\text{if } m = 6 \quad \frac{1}{2} > \frac{1}{2} = \frac{1}{2} \quad \checkmark$$



$$f(z) = a(z - \zeta)^2 + \eta$$

$$\stackrel{z=0}{\Rightarrow} + \eta = \xi \Rightarrow a = -\frac{1}{\zeta}$$

$$f(z) = -\frac{1}{\zeta} z^2 + 2z - 1 + \eta = -\frac{1}{\zeta} z^2 + 2z + \xi$$

$$S = 2$$

$$P = -1$$

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



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

$$\frac{\alpha + \beta}{\alpha \beta} = \frac{S}{P} = \frac{2}{-1}$$

$$\checkmark = -\frac{1}{\zeta}$$

$$z^2 - (\xi a + \zeta)z + (\zeta a^2 + \eta a + \xi) = 0$$

$$\checkmark = -1$$

$$z = \zeta \Rightarrow \xi - \Lambda a - \Lambda + \zeta a^2 + \eta a + \xi = 0$$

$$\zeta a^2 - 2a - 1 = 0$$

$$\Rightarrow \begin{cases} a = 1 \rightarrow z^2 - \Lambda z + 1 \zeta \end{cases}$$

$$\begin{cases} a = -\frac{1}{\zeta} \rightarrow z^2 - \frac{\Lambda}{\zeta} z + \frac{1}{\zeta} - \frac{\zeta}{\zeta} = \zeta z^2 - \Lambda z + \xi \Rightarrow z_1 = \frac{\zeta}{\Lambda} \end{cases}$$

$$\zeta z^2 - \Lambda z + \xi = (z - \zeta)(z - \zeta) \Rightarrow \frac{\zeta}{\zeta} = \zeta$$