

$$g = (a-1)x^2 + x + 3$$

.1

$$\frac{-b}{2a} = 2 \Rightarrow \frac{-1}{2(a-1)} = 2 \Rightarrow -1 = 4(a-1) \Rightarrow -1 = 4a - 4 \Rightarrow 4a = 3 \Rightarrow a = \frac{3}{4}$$

$$\Rightarrow g = -\frac{1}{4}x^2 + x + 3 \Rightarrow x^2 - 4x - 12 = 0 \Rightarrow (x-6)(x+2) = 0$$

$\checkmark x = 6$ $x = -2$
 قن قن

$$\Delta > 0, m < 0 \Rightarrow \text{دو ریشه حقیقی}$$

.2

$$\Delta > 0 \Rightarrow 25 - 4m^2 > 0 \Rightarrow m^2 < \frac{25}{4} \Rightarrow -\frac{5}{2} < m < \frac{5}{2}$$

$$m < 0 \Rightarrow -\frac{5}{2} < m$$

$$\left(\frac{3 \pm \sqrt{5}}{3}\right) \times 2 \Rightarrow \frac{6 \pm 2\sqrt{5}}{6} \Rightarrow b = -6, a = 3$$

.3

$$\Delta = 20 \Rightarrow b^2 - 4ac = 20 \Rightarrow 36 - 12c = 20$$

$$(3x^2 - 6x + \frac{4}{3}) \times 3 = 9x^2 - 18x + 4 = 0 \Rightarrow c = \frac{4}{3}$$

$$S = 4 \quad \rho = \frac{m+2}{2}$$

$$3\alpha^2 + \beta^2 = 12 \Rightarrow \alpha^2 + \beta^2 + 2\alpha^2 = 12$$

.4

$$\alpha^2 + \beta^2 = S^2 - 2\rho \Rightarrow \alpha^2 + \beta^2 + 8\alpha - (m+2) = 12 \Rightarrow 16 - (m-2) + 8\alpha - m - 2 = 12$$

$$2\alpha^2 + 4\alpha - 8\alpha + 2 = 0 \Rightarrow 2\alpha^2 - 4\alpha + 2 = 0 \Rightarrow \alpha = 1 \Rightarrow m = 4$$

$$\frac{-b}{2a} = 2 \Rightarrow -b = 4a \Rightarrow b = -4a$$

.5

$$g(2) = 9 \Rightarrow 4a + 2b + 5 = 9 \Rightarrow 2a - 4a = 2 \Rightarrow -2a = 2 \Rightarrow a = -1$$

$$\Rightarrow y = x^2 + 4x + 5 \Rightarrow (x-5)(x+1)$$

$\begin{array}{c|c|c} -1 & 5 & b = 4a = -4 \\ \hline - & + & - \end{array} \Rightarrow (-1, 5)$

$$\sqrt{\beta} = \frac{9\beta}{\alpha} \Rightarrow \alpha^2 = 9 \Rightarrow \alpha = \pm 3$$

.6

$$\alpha = 3 \Rightarrow 3 + \beta = \frac{7}{3} \Rightarrow \beta = -\frac{2}{3} \rightarrow \text{غیر منقول}$$

$$\alpha = -3 \Rightarrow -3 + \beta = \frac{7}{3} \Rightarrow \beta = \frac{10}{3} \rightarrow \text{منقول}$$

$$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{1}{-3} + \frac{1}{\frac{10}{3}} = -\frac{1}{3} + \frac{3}{10} = \frac{-10 + 9}{30} = -\frac{1}{30}$$

$$\beta^2 + m\beta - 2m = 0 \Rightarrow -m\beta^2 = \beta^2 - 2m$$

.7

$$\alpha^2 - m\beta = 8 \Rightarrow \alpha^2 - \beta^2 - 2m = 8 \Rightarrow \alpha^2 + 2m - 8 = 0 \Rightarrow (m+4)(m-2)$$

$$\alpha^2 + \beta^2 = 5 - 2p$$

$$m = 4 \Rightarrow \Delta < 0 \rightarrow \text{غير قابل قبول}$$

$$m = 2 \Rightarrow \Delta > 0 \checkmark$$

$$\Rightarrow \alpha^2 + 2m - 4 = 0 \Rightarrow 5 = -2$$

$$\Delta = 16 - 4m \left(\frac{m+4}{4} \right) = -2m^2 - 28m + 16 = 0$$

.8

$$\frac{-\Delta}{4a} = \frac{2m^2 + 28m - 16}{4m} = 8 \Rightarrow m^2 + 14m - 8 = 16m \Rightarrow (m-4)(m+2) = 0$$

$$m = 4 \rightarrow \text{غير قابل قبول} \quad \Rightarrow -2\alpha^2 + 4\alpha + 6 = 0 \Rightarrow (\alpha+3)(\alpha+1) = 0$$

$$m = -2 \checkmark \text{ قابل قبول}$$

$$\alpha = -3 \quad \text{و} \quad \alpha = -1$$

$$\frac{-b}{2a} = 2 \Rightarrow +b = 4a$$

8

.9

$$\alpha = 2 \Rightarrow 4a + 2b + 4 = 6 \Rightarrow 2a + b = 1 \Rightarrow 2a - 4a = 1 \Rightarrow -2a = 1 \Rightarrow a = -\frac{1}{2}$$

$$b = -4a \Rightarrow -4 \times -\frac{1}{2} = 2$$

$$\frac{1}{\alpha} + \frac{1}{\beta} = \frac{4}{8} = \frac{1}{2}$$

$$\alpha = 2 \Rightarrow 3\alpha^2 - 2\alpha - 1 = 0 \Rightarrow \alpha = 1, \alpha = -\frac{1}{3}$$

$$\alpha = 1 \Rightarrow \alpha^2 - 8\alpha + 12 = 0 \Rightarrow (\alpha-2)(\alpha-6) = 0 \Rightarrow \alpha = 6 \checkmark$$

$$\alpha = -\frac{1}{3} \Rightarrow \alpha^2 - \frac{8}{3} + \frac{4}{3} = 0 \Rightarrow \Delta = 64 - 48 = 16$$

$$\frac{8 \pm \sqrt{16}}{6} \Rightarrow \alpha = 2, \alpha = \frac{2}{3} \checkmark$$