

طالعہ عالیہ علماء دیوبند، یازدہم سہ ماہی، سال 1418ھ

$$\frac{S_2}{S_1} = \frac{m \times L_2}{m \times L_1} \Rightarrow \frac{S_2}{S_1} = \frac{1 + \sqrt{5}}{2} = \frac{r + r\sqrt{5}}{1} = \frac{r + r\sqrt{5}}{1} \quad (2)$$

$$5. \quad \begin{array}{c} A \quad a \quad B \\ b \quad \quad \quad c \\ O \quad \quad \quad \end{array} \rightarrow a^2 + b^2 = \frac{r + r\sqrt{5}}{r} a^2 \rightarrow b^2 = \frac{r + r\sqrt{5}}{r} a^2 \rightarrow \frac{a^2}{b^2} = \frac{r}{r + r\sqrt{5}} = \frac{1}{1 + \sqrt{5}} = \frac{\sqrt{5} - 1}{2} \quad (2)$$

$$ra - r = -\sqrt{ra^2 + r^2} \rightarrow 9x^2 - 12a + r = ra^2 + r^2 \Rightarrow 7a^2 - 12a + r = 0$$

$$a^2 - 12a + r = 0 \rightarrow (a - 12)(a - r) = 0 \rightarrow a = 12, \frac{r}{7} \quad (2)$$

$$a = 12 \rightarrow r = -12 \quad \text{غیر ممکن}$$

$$10. \quad a = \frac{r}{7} \rightarrow \frac{-12}{7} = \frac{-12}{7} \quad \checkmark \rightarrow \frac{9}{4} / \frac{r}{7} = \frac{9}{r} \quad \checkmark$$

$$x \geq -1 \leftarrow \sqrt{x+1} - \frac{\sqrt{x+1}}{x-1} = \frac{x-1}{\sqrt{x-1}} \rightarrow (\sqrt{x+1}) \left(\frac{1}{\sqrt{x-1} + 1} - \frac{1}{x-1} \right) = \frac{\sqrt{x-1} \sqrt{x-1}}{\sqrt{x-1}} \quad (2)$$

$$\sqrt{x+1} \left(\frac{1}{\sqrt{x+1} + 1} - \frac{1}{x-1} \right) = \sqrt{x-1} \rightarrow x > 1 \rightarrow \text{تایید} \quad (2)$$

$$15. \quad -r\sqrt{x+1} = 1 - x \rightarrow rx + r = x^2 - r^2x + 1 \Rightarrow x^2 - r^2x + 94 = 0$$

$$x = \frac{r^2 \pm \sqrt{192}}{2} \rightarrow x = 12 + \sqrt{48} \rightarrow \text{کب، مثبت، صحیح} \quad \checkmark$$

$$\frac{1}{\sqrt{r-x} + r} + \frac{1}{\sqrt{r-x} - r} = \frac{r-x}{\omega \sqrt{r-x}} \Rightarrow \frac{1}{t+r} + \frac{1}{t-r} = \frac{t^2}{\omega t} \quad (2)$$

$$20. \quad t \neq 0 \quad \frac{t-r+t+r}{t^2-\varepsilon} = \frac{t}{\omega} \Rightarrow \frac{rt}{t^2-\varepsilon} = \frac{t}{\omega} \rightarrow \frac{r}{t^2-\varepsilon} = \frac{1}{\omega} \rightarrow t^2-\varepsilon = 10$$

$$t^2 = 15 \rightarrow t = \pm \sqrt{15} \rightarrow t = \sqrt{15} = \sqrt{r-x} \Rightarrow x = -12 \quad \checkmark \quad \text{مستند، صحیح}$$

$$\frac{1}{x^2} + \frac{1}{(1-x)^2} = \frac{14}{9} \Rightarrow \frac{rx^2 - rx + 1}{x^2(x-1)^2} = \frac{14}{9} \Rightarrow x^2 - x = t \rightarrow \frac{rt+1}{t^2} = \frac{14}{9} \quad (2)$$

$$25. \quad \frac{t^2 + rt + 1}{t^2} = \frac{14}{9} \rightarrow \left(\frac{t+1}{t} \right)^2 = \left(\frac{14}{9} \right)^2 \left\{ \begin{array}{l} \frac{t+1}{t} = \frac{14}{9} \rightarrow t = \frac{r}{11} \\ \frac{t+1}{t} = -\frac{14}{9} \rightarrow t = -\frac{r}{19} \end{array} \right. \quad (2)$$

$$\left. \begin{array}{l} x^2 - x = \frac{r}{11} \Rightarrow x^2 - x - \frac{r}{11} = 0 \rightarrow \Delta > 0, S = \frac{-b}{a} = 1 \\ x^2 - x = -\frac{r}{19} \Rightarrow x^2 - x + \frac{r}{19} = 0 \rightarrow \Delta > 0, S = \frac{-b}{a} = 1 \end{array} \right\} \quad \text{صحیح، صحیح} \quad \checkmark \quad S = 1$$

$$\sqrt{x + \sqrt{-x^2 + 4x + 4}} + \sqrt{x^2 + \sqrt{-x^2 + 4x + 4}} = x + 2 \quad -V$$

$$-x^2 + 4x + 4 \geq 0 \rightarrow x^2 - 4x - 4 \leq 0 \rightarrow (x-2)(x+2) \leq 0 \quad (r)$$

$$\rightarrow (x-2)(x+2) \leq 0 \quad \begin{array}{c} -2 \quad 2 \\ + \quad - \quad + \\ - \quad + \quad - \end{array} \quad (-\infty, -2] \cup [2, \infty) \quad I$$

$$5. -x^2 + 4x + 4 \geq 0 \rightarrow x^2 - 4x + 4 \leq 0 \rightarrow (x-2)(x-2) \leq 0 \quad \begin{array}{c} 2 \quad 2 \\ + \quad - \quad + \\ - \quad + \quad - \end{array} \quad [2, 2] \quad II$$

$$I \cap II = \{2\} \rightarrow \sqrt{4} + \sqrt{4} = 4 \quad \text{بالحساب}$$

$$y = |x+2| + |x-1| \rightarrow \begin{cases} y = x+3 & x \geq 1 \\ y = 2 & -2 \leq x \leq 1 \\ y = -x-1 & x \leq -2 \end{cases} \quad (r) \quad -\Delta$$

$$10. \quad y + x = 14 \Rightarrow y = -\frac{1}{x}x + \frac{14}{x} \quad \left\{ \begin{array}{l} x \geq 1 \rightarrow x+1 = \frac{1}{x}x + \frac{14}{x} \rightarrow 4x + x = -x + 14 \Rightarrow x = 3 \\ -2 \leq x \leq 1 \rightarrow x = \frac{1}{x}x + \frac{14}{x} \rightarrow -x + 14 = 9 \Rightarrow x = 5 \\ x \leq -2 \rightarrow -x-1 = \frac{1}{x}x + \frac{14}{x} \Rightarrow -4x - x = x + 14 \Rightarrow 5x = -14 \Rightarrow x = -\frac{14}{5} \end{array} \right. \quad y = \Delta$$

$$A \begin{vmatrix} r \\ \Delta \end{vmatrix} B \begin{vmatrix} -\varepsilon \\ v \end{vmatrix} \rightarrow \sqrt{r^2 + \varepsilon^2} = \sqrt{r^2} = r\sqrt{1} \quad \checkmark \quad \begin{array}{l} x = \varepsilon \\ y = v \end{array}$$

$$15. \quad y = \sqrt{x^2 - 4x + 4} = |x-2| \rightarrow \begin{array}{l} x-2 \quad x \geq 2 \\ -x+2 \quad x \leq 2 \end{array} \quad -4$$

$$y = \frac{1}{x}x + 2 \quad \left\{ \begin{array}{l} x \geq 2 \Rightarrow x-2 = \frac{1}{x}x + 2 \rightarrow x = 4, y = \frac{1}{2} \\ x \leq 2 \Rightarrow -x+2 = \frac{1}{x}x + 2 \rightarrow x = 0, y = 2 \end{array} \right. \quad (r)$$

$$20. \quad C = \begin{vmatrix} r \\ 0 \end{vmatrix} A \begin{vmatrix} 1 \\ 4 \end{vmatrix} B \begin{vmatrix} 0 \\ r \end{vmatrix} \rightarrow \left. \begin{array}{l} BC = -x+2 \Rightarrow y+x-2=0 \\ \overline{AH} = \frac{|4 \cdot 1 - r|}{\sqrt{r}} = \frac{1r}{\sqrt{r}} = \sqrt{r} \\ \overline{BC} = \sqrt{1} \end{array} \right\} \quad \frac{4\sqrt{r} \cdot \sqrt{r}}{r} = 4 \quad \checkmark$$

$$\frac{1}{x} + \frac{1}{x+4} = \frac{1}{r} \Rightarrow \frac{r+4}{x^2+4x} = \frac{1}{r} \Rightarrow x^2+4x = r \cdot x + 4r \rightarrow x^2 - rx - 4r = 0 \quad (r)$$

$$25. \quad \begin{array}{c} 34, -2 \\ \checkmark \text{ حل } 34 \text{ بجواب } \leftarrow \overline{OE} \\ \text{حل } 30 \text{ بجواب } \leftarrow \overline{OE} \end{array}$$