

$$\frac{a}{b} = \frac{a}{r} \Rightarrow b = \frac{r}{a} a \quad \underline{1, 2, 5}$$

شکریہ: محققان و نویسندگان
سوال (1)

$$\frac{a+x}{b} = \frac{1+\sqrt{a}}{r} \Rightarrow \frac{a+x}{\frac{r}{a}} = \frac{1+\sqrt{a}}{r} \Rightarrow \omega a + \omega x = (r + r\sqrt{a}) a$$

$$x = \frac{(r\sqrt{a} - r)a}{\omega}$$

$$\frac{S_{\text{مجموع}}}{S_{\text{مجموع}}} = \frac{(a+x)b}{a \cdot b} = \frac{a+x}{a} = \frac{a \left(\frac{r\sqrt{a} - r}{\omega} \right)}{a} = \frac{r\sqrt{a} - r}{\omega} \quad \checkmark$$

$$\frac{d_{\text{مجموع}}}{\text{طول موج}} = \frac{\sqrt{a^2 + b^2}}{a} = \frac{1+\sqrt{a}}{r} \Rightarrow \frac{a^2 + b^2}{a^2} = \left(\frac{1+\sqrt{a}}{r} \right)^2 \Rightarrow 1 + \frac{b^2}{a^2} = \frac{r + 2\sqrt{a}}{r}$$

سوال (2)

$$\Rightarrow 1 + \frac{b^2}{a^2} = \frac{r + \sqrt{a}}{r} = \frac{\sqrt{a} + r}{r} \Rightarrow \frac{b^2}{a^2} = \frac{\sqrt{a} + 1}{r} \Rightarrow \frac{a^2}{b^2} = \frac{r}{\sqrt{a} + 1} = \frac{r(\sqrt{a} - 1)}{(\sqrt{a} - 1)(\sqrt{a} + 1)}$$

$$\Rightarrow \frac{a^2}{b^2} = \frac{r(\sqrt{a} - 1)}{r} = \frac{\sqrt{a} - 1}{1} \quad \text{دقت!}$$

$$r a + \sqrt{a^2 + r a} = r$$

$$\sqrt{r a^2 + r a} = r - r a$$

$$r a^2 + r a = r^2 - 2 r^2 a + r^2 a^2$$

سوال (3)

$$\Rightarrow \sqrt{a^2 - 16 a + r} = 0 \quad \text{بجای} \quad a^2 - 16 a + r = 0 \quad (a - 16)(a - r) = 0 \quad \begin{cases} a = \frac{r}{16} \\ a = 16 \end{cases} \quad \text{دقت!}$$

$$r - 16 a > 0 \Rightarrow a < \frac{r}{16} \Rightarrow a = \frac{r}{16}$$

$$\frac{a+1}{a} = \frac{\frac{r}{16} + 1}{\frac{r}{16}} = \frac{r + 16}{r} = \frac{r}{r} = 1 \quad \checkmark$$

$$\frac{\sqrt{x+1}}{\sqrt{x-1} + r} - \frac{\sqrt{x+1}}{r - \sqrt{x-1}} = \frac{x-1}{\sqrt{x-1}} \Rightarrow \frac{\sqrt{x+1}}{\sqrt{x-1} + r} + \frac{\sqrt{x+1}}{\sqrt{x-1} - r} = \frac{x-1}{\sqrt{x-1}} \quad \text{سوال (4)}$$

$$\frac{r(\sqrt{x+1})(\sqrt{x-1}) + r\sqrt{x+1} - r\sqrt{x+1}}{(x-1) - r} = \frac{x-1}{\sqrt{x-1}}$$

$$\frac{r\sqrt{x+1} \times \sqrt{x-1}}{x-1} = \frac{x-1}{\sqrt{x-1}} \Rightarrow r\sqrt{x+1} = x-1$$

$$r x + r^2 = x^2 - 2 r x + 100$$

$$x^2 - 2 r x + 100 = 0 \rightarrow x_{1,2} = \frac{2 r \pm \sqrt{4 r^2 - 400}}{2}$$

$$S = -\frac{b}{a} = 2 r > 0 \quad \rightarrow 12 \pm 4\sqrt{16}$$

$$P = \frac{c}{a} = 100 > 0 \rightarrow x - 1 > 0 \quad x > 1$$

$$\checkmark \quad \text{جواب مثبت دارد} \quad 12 - 4\sqrt{16} < 100 \quad 12 + 4\sqrt{16} > 100$$

$$\frac{1}{\sqrt{2-x}+2} - \frac{1}{2-\sqrt{2-x}} = \frac{2-x}{\omega\sqrt{2-x}}$$

$$\Rightarrow \frac{(\sqrt{2-x}-2)+(\sqrt{2-x}+2)}{(\sqrt{2-x}+2)(\sqrt{2-x}-2)} = \frac{2-x}{\omega\sqrt{2-x}} \Rightarrow \frac{2\sqrt{2-x}}{(2-x)-4} = \frac{2-x}{\omega\sqrt{2-x}}$$

مخرج رو صفر مینماید!

$$\Rightarrow 10 = x^2 - 4 \Rightarrow x^2 = 14 \Rightarrow x = \pm \sqrt{14}$$

فرضین و طین

$$\rightarrow -10(2-x) = 4 - x^2 \rightarrow x^2 + 10x - 24 = 0 \rightarrow \begin{cases} x=2 \\ x=-12 \end{cases}$$

معادله ها نسبتاً دور از خود!

$$\frac{1}{x^2} + \frac{1}{(2-x)^2} = \frac{16}{9} \Rightarrow \frac{(2-x)^2 + x^2}{(x^2(2-x)^2)^2} = \frac{16}{9} \Rightarrow \frac{4 - 4x + x^2 + x^2}{(x^2(2-x)^2)^2} = \frac{16}{9}$$

$$\Rightarrow \frac{2x^2 - 4x + 4}{(x^2(2-x)^2)^2} = \frac{16}{9} \Rightarrow \frac{2x^2 - 4x + 4}{x^4(2-x)^4} = \frac{16}{9}$$

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$$\sqrt{x + \sqrt{-x^3 + 6x^2 + 20x - 16}} + \sqrt{x^2 - \sqrt{-x^3 + 6x^2 + 20x - 16}} = x + 2$$

$$Df_1 \Rightarrow -x^3 + 6x^2 + 20x - 16 = -x^2(x-4) + 20(x-4) \Rightarrow (x-4)(20-x^2)$$

$$= (x-4)(\omega-x)(\omega+x)$$

$$Df_1: \begin{array}{c|ccc} x & -\omega & 4 & \omega \\ \hline f_1 & + & - & + \end{array}$$

$$(-\infty, -\omega] \cup [\omega, \infty)$$

$$Df_2 \Rightarrow -x^3 + 6x^2 - 1 = -(x-1)(x^2 - 5x + 1) \Rightarrow Df_2: \begin{array}{c|cc} x & 1 & \kappa \\ \hline f_2 & - & + \end{array}$$

$$Df_1 \cap Df_2 \rightarrow x=4 \Rightarrow \sqrt{4 + \sqrt{-(4)^3 + 6(4)^2 + 20(4) - 16}} + \sqrt{(4)^2 - \sqrt{-(4)^3 + 6(4)^2 + 20(4) - 16}} = \sqrt{4} + \sqrt{16} = (4) + 2$$

مساویات دارد

$$y = |x+2| + |x-1|, \quad 3y + x = 17 \Rightarrow -\frac{x}{3} + \frac{17}{3} = y$$

$$\begin{cases} x \geq 1; & y_1 = y_2 & 3x+1 = -\frac{x}{3} + \frac{17}{3} \Rightarrow \frac{10x}{3} = \frac{14}{3} \Rightarrow x = \frac{14}{10} = 1.4 \end{cases}$$

$$\begin{cases} -2 \leq x < 1; & y_1 = y_2 & p = -\frac{x}{3} + \frac{17}{3} = \frac{x}{3} + \frac{1}{3} \Rightarrow x = 1 \end{cases}$$

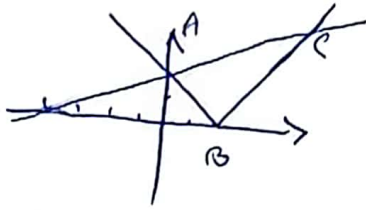
$$\begin{cases} x < -2; & y_1 = y_2 & -x-1 = -\frac{x}{3} + \frac{17}{3} \Rightarrow -\frac{2x}{3} = \frac{20}{3} \Rightarrow x = -10 \end{cases}$$

$$d_{AB} = \sqrt{8x^2 + 6y^2} = \sqrt{(2-(-10))^2 + (4-16)^2} = \sqrt{144 + 144} = \sqrt{288} = 12\sqrt{2}$$

مسئلہ ۱۹

$$y = \frac{1}{r}x + r$$

$$y = \sqrt{x^2 - 8x + 16} = \sqrt{(x-4)^2} = |x-4|$$



$$AB = \sqrt{2^2 + 2^2} = 2\sqrt{2}$$

$$BC = \sqrt{(1-7)^2 + (4-0)^2} = \sqrt{36 + 16} = \sqrt{52} = 2\sqrt{13}$$

$$S = \frac{AB \times BC}{2} = \frac{2\sqrt{2} \times 2\sqrt{13}}{2} = 4\sqrt{26}$$

$$\frac{1}{r}x + r = |x-4|$$

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$$\begin{aligned} \left\{ \begin{array}{l} x > 4 \\ x < 4 \end{array} \right. & \begin{aligned} \frac{1}{r}x + r &= x-4 \Rightarrow \frac{1}{r}x = x-4 \Rightarrow x = 4 \\ \frac{1}{r}x + r &= -x+4 \Rightarrow \frac{r}{r}x + r = -x+4 \Rightarrow x = 4-r \end{aligned} \end{aligned}$$

$$\frac{1}{x} + \frac{1}{x-9} = \frac{1}{r} \Rightarrow \frac{(x-9)+x}{x^2-9x} = \frac{1}{r} \Rightarrow r(2x-9) = x^2-9x$$

مسئلہ ۱۰

(۱۷۵)

$$\left. \begin{array}{l} x-9 > 0 \Rightarrow x > 9 \\ x > 0 \end{array} \right\} \rightarrow \begin{array}{l} x = 9 \\ x = 18 \end{array}$$

$$\begin{aligned} x^2 - 18x + 180 &= 0 \\ (x-6)(x-12) &= 0 \end{aligned}$$

مساحت بیرونی دو مثلثات = $34h$