

نام و نام خانوادگی: پایگاه اطلاعاتی: پاسخنامه تشریحی تکلیف شماره ۱۸ کلاس: ریاضی دوم دبیرستان

$$\text{نسبت طول عرض طلایی} = \frac{1+\sqrt{5}}{2} = \frac{n}{2+\sqrt{5}n} \rightarrow n = 2n + 2\sqrt{5}n$$

$$\left. \begin{aligned} S_{\text{قدیم}} &= (4n)(5n) \\ S_{\text{جدید}} &= (4n)(2n+2\sqrt{5}n) \end{aligned} \right\} \rightarrow \frac{S_{\text{جدید}}}{S_{\text{قدیم}}} = \frac{4n \times (2n+2\sqrt{5}n)}{4n \times 5n} \rightarrow = \frac{2+2\sqrt{5}}{5} \checkmark$$

$$\frac{\text{قطر}}{\text{طول}} = \frac{1+\sqrt{5}}{2} \rightarrow \text{قطر} = \sqrt{\text{طول}^2 + \text{عرض}^2} \rightarrow \frac{\text{قطر}^2}{\text{طول}^2} = \frac{\text{عرض}^2 + \text{طول}^2}{\text{طول}^2} \rightarrow \frac{n^2+y^2}{n^2} = \frac{4+2\sqrt{5}}{4} \rightarrow 4n^2+4y^2 = (4+2\sqrt{5})n^2 \rightarrow (2+2\sqrt{5})n^2 = 4y^2 \rightarrow \frac{n^2}{y^2} = \frac{4}{4+2\sqrt{5}} = \frac{2-2\sqrt{5}}{-4} = \frac{\sqrt{5}-1}{2} \checkmark$$

$$3a + \sqrt{4a^2+4a} = 2 \rightarrow 3a-2 = -\sqrt{4a^2+4a} \rightarrow 9a^2+4-12a = 4a^2+4a \rightarrow 5a^2-14a+4=0 \rightarrow a=2 \rightarrow \text{جوابی نه} \checkmark \rightarrow a=\frac{2}{5} \checkmark \rightarrow \frac{a+1}{a} = \frac{\frac{2}{5}+1}{\frac{2}{5}} = \frac{7}{2} = \frac{4}{2} \checkmark$$

$$\frac{\sqrt{n+1}}{\sqrt{2n+1}} + \frac{\sqrt{n+1}}{\sqrt{2n-1}} = \frac{n-1}{\sqrt{2n-1}} \rightarrow \frac{\sqrt{n+1}(\sqrt{2n-1}+\sqrt{2n+1})}{n-1} = \sqrt{2n-1} \rightarrow \frac{2\sqrt{n+1}}{n-1} = 1 \rightarrow 2\sqrt{n+1} = n-1 \rightarrow 4n+4 = n^2-2n+1 \rightarrow n^2-6n+3=0 \rightarrow n = \frac{6 \pm \sqrt{36-12}}{2} = \frac{6 \pm 2\sqrt{3}}{2} = 3 \pm \sqrt{3} \rightarrow n = 3 + \sqrt{3} \checkmark$$

$$\frac{1}{\sqrt{2-n}+2} + \frac{1}{\sqrt{2-n}-2} = \frac{2-n}{5\sqrt{2-n}} \rightarrow \frac{2\sqrt{2-n}}{-(n+2)} = \frac{2-n}{5\sqrt{2-n}} \rightarrow 10(2-n) = (2-n)(-n-2) \rightarrow 10 = -n-2 \rightarrow n = -12 \rightarrow \text{ریشه مثبت ندارد} \checkmark$$

$$\frac{1}{n^2} + \frac{1}{(1-n)^2} = \frac{140}{9} \rightarrow \frac{n^2 - 2n + 1}{[n(1-n)]^2} = \frac{140}{9}$$

$$\frac{n-n^2t}{t^2} = \frac{140}{9} \rightarrow 140t^2 + 18t - 9 = 0$$

$$\rightarrow t = \frac{-18 \pm \sqrt{18^2 + 4 \cdot 140 \cdot 9}}{2 \cdot 140} \quad \begin{cases} t = \frac{3}{14} = n - n^2 \rightarrow n^2 - n + t = 0 \rightarrow S = 1 \\ t = -\frac{3}{14} = n - n^2 \rightarrow n^2 - n + t = 0 \rightarrow S = 1 \end{cases}$$

$$\rightarrow n = \frac{1 \pm \sqrt{1 - 4t}}{2} \quad \begin{cases} n = \frac{1 + \frac{3}{14}}{2} \\ n = \frac{1 - \frac{3}{14}}{2} \end{cases} \quad S = 1 + 1 = 2 \quad \checkmark$$

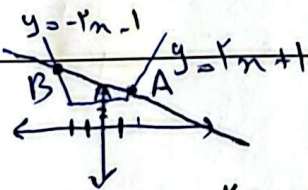
دالة $\rightarrow -n^2 + 4n - 1 = -(n-2)(n-4) \geq 0 \rightarrow n \in [2, 4]$

$$\rightarrow -n^2 + 4n + 12n - 100 = -(n-4)(n-5)(n+5) \geq 0$$

$$\rightarrow n \in [4, 5] \cup (-\infty, -5]$$

اشترك $D = \{4\} \rightarrow$ بين جوابی دعه $\rightarrow 4 = 2 + 2 = 2 + n \quad \checkmark$

$4 =$ کل جواب $\checkmark$

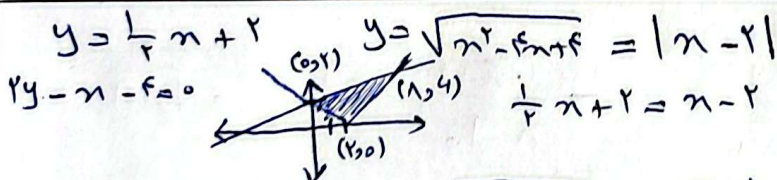


$$3y + n = 17 \rightarrow y = -\frac{n}{3} + \frac{17}{3}$$

$$2n + 1 = -\frac{n}{3} + \frac{17}{3} \rightarrow \frac{14}{3} = \frac{17}{3} - n \rightarrow n = 2, y = 5$$

$$-2n - 1 = -\frac{n}{3} + \frac{17}{3} \rightarrow \frac{5}{3}n = -\frac{20}{3} \rightarrow n = -4, y = 9$$

$$\rightarrow AB = \sqrt{4^2 + 12^2} = \sqrt{160} = 4\sqrt{10} \quad \boxed{2\sqrt{10}} \quad \text{دقت!}$$



$$\text{مساحت} = \frac{1}{2} \times \text{طول} \times \text{ارتفاع} = \frac{1}{2} \times 4 \times \sqrt{5} = 2\sqrt{5}$$

سرعت $\rightarrow$ n

$$\frac{1}{n} + \frac{1}{n+9} = \frac{1}{40} \rightarrow \frac{2n+9}{n(n+9)} = \frac{1}{40} \rightarrow n^2 + 9n = 40n + 360$$

$$\rightarrow n^2 - 31n - 360 = 0 \rightarrow (n-34)(n+10) = 0$$

$$\rightarrow n = 34 \rightarrow 34 \text{ ساعت} \quad \checkmark$$