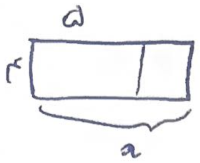
یازدهم پسر B — معصومی

۲۰ آفرین!

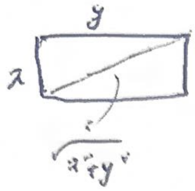
۱- (۲)



$$\frac{x}{\frac{4}{2}} = \frac{\sqrt{5}+1}{2} \qquad x = 2(\sqrt{5}+1)$$

$$\frac{\text{s طلایی}}{\text{s اولیه}} = \frac{\frac{4}{8}x}{4\times5} = \frac{2(\sqrt{5}+1)}{5} = 0.4(\sqrt{5}+1) = \frac{4\sqrt{5}}{10} + \frac{4}{10} = \frac{4\sqrt{5}+4}{10}$$

۲- (۲)



$$\frac{\sqrt{x^2+y^2}}{y} = \frac{1+\sqrt{5}}{2} \xrightarrow{\text{توان ۲}} \frac{x^2+y^2}{y^2} = \frac{6+2\sqrt{5}}{4}$$

$$1+\frac{x^2}{y^2} = \frac{6+2\sqrt{5}}{4}$$

$$1+\left(\frac{x}{y}\right)^2 = \frac{6+2\sqrt{5}}{4} \Rightarrow \left(\frac{x}{y}\right)^2 = \frac{2+2\sqrt{5}}{4}$$

$$\left(\frac{y}{x}\right)^2 = \frac{2}{1+\sqrt{5}} \Leftarrow \left(\frac{y}{x}\right)^2 = \frac{4}{2+2\sqrt{5}} = \frac{2(2)}{2(1+\sqrt{5})}$$

۳- (۲)

$$\sqrt{2a^2+4a} = 2-3a$$

$$2a^2+4a = 4+9a^2-12a$$

$$7a^2-16a+4=0$$

$$\frac{16\pm\sqrt{256-112}}{14} = \frac{16\pm 12}{14} \to \frac{4}{14} = \frac{2}{7}, \quad 2 \text{ غ ق}$$

$$\frac{\frac{2}{7}+1}{\frac{2}{7}} = \frac{\frac{9}{7}}{\frac{2}{7}} = \frac{9}{2} = 4.5$$

۴- (۲)

$$\frac{3\sqrt{x+1}-\sqrt{x^2-1}-\sqrt{x^2-1}-3\sqrt{x+1}}{9-(x-1)} \Rightarrow \frac{-2\sqrt{x^2-1}}{10-x} = \frac{(\sqrt{x-1})(\sqrt{x+1})}{(\sqrt{x-1})}$$

$$\frac{-2(\sqrt{x-1})(\sqrt{x+1})}{10-x} = \sqrt{x+1}$$

$$2\sqrt{x+1} = x-10$$

$$4(x+1) = x^2-20x+100 \Rightarrow x^2-24x+96=0$$

$$\frac{24\pm\sqrt{576-384}}{2} \quad (192)$$

$$\frac{24+8\sqrt{3}}{2} \text{ ق ق} \qquad \frac{24-8\sqrt{3}}{2} \text{ غ ق}$$

۱ ریشه

~~$\frac{24\pm\sqrt{576-...}}{2}$, $\frac{24\pm4\sqrt{10}}{2}$, $12\pm2\sqrt{10}$, $12-2\sqrt{10}$ غ ق, $12+2\sqrt{10}$ ق ق~~

۵- ②

$$\frac{1}{2+\sqrt{2-x}} - \frac{1}{2-\sqrt{2-x}} = \frac{(\sqrt{2-x})(\sqrt{2+x})}{5\sqrt{2+x}}$$

$$\frac{2-\sqrt{2-x} - 2-\sqrt{2-x}}{4-(2-x)} = \frac{\sqrt{2+x}}{5} \Rightarrow \frac{-2\sqrt{2-x}}{2+x} = \frac{\sqrt{2+x}}{5}$$

$$(\sqrt{2-x})(\sqrt{2+x})$$

$$-10 = 2+x$$

$$\boxed{-12 = x} \rightarrow$$ ریشه مثبت ندارد ✓

۶- ②

$$\frac{1}{x^2} + \frac{1}{(1-x)^2} = \frac{160}{9}$$

$$9 - 18x + 9x^2 + 9x^2 = 160x^2 - 320x^3 + 160x^4$$

$$160x^4 - 320x^3 + 142x^2 - 18x + 9 = 0$$

$$S = -\frac{b}{a} = \frac{320}{160} = ②$$ ✓

مجموع ریشه‌ها

۷- ③

$$-x^2+6x-8 \geq 0$$

$$\frac{-6 \pm \sqrt{36-32}}{-2} \quad 2,\ 4$$

①

$$-x^3+4x^2+25x-100 \geq 0$$

-1	4	25	-100
-1	0	25	0

$$(x-4)(-x^2+25)$$

③

$$①,② \Rightarrow \{4\}$$

$$\sqrt{4} + \sqrt{16} = 6$$

$$\boxed{x=4} \leftarrow ①$$ ✓

۸- ②

$$y = |x+2| + |x-1|$$

$$y = -\frac{1}{3}x + \frac{17}{3}$$

$$x+2+x-1 = 2x+1 = -\frac{1}{3}x + \frac{17}{3}$$

$$\frac{7}{3}x = \frac{14}{3}$$

$$\boxed{x=2} \quad \boxed{y=5}$$

$$-x-2-x+1$$

$$-2x-1 = -\frac{1}{3}x + \frac{17}{3}$$

$$-\frac{5}{3}x = \frac{20}{3}$$

$$\boxed{x=-4} \quad y=7$$

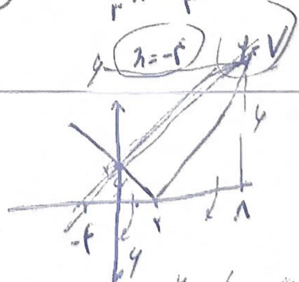
$$\sqrt{(7-5)^2 + (6)^2} = \boxed{\sqrt{40}}$$ ✓

۹- ③

$$y = |x-2| \qquad y = \frac{1}{2}x + 2$$

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

$$\frac{x}{2} = 4 \qquad x = 8$$



$$S = \frac{12 \times 6}{2} - \left(\frac{4 \times 6}{2} + \frac{6 \times 2}{2}\right) = \boxed{12}$$ ✓

$$\frac{1}{x} + \frac{1}{x+9} = \frac{1}{20}$$

-١٠

(٢)

$$20x + 180 + 20x = x^2 + 9x \quad \Rightarrow \quad x^2 - 31x + 180 = 0$$

$$(x-36)(x+5) \quad \Longrightarrow \quad \boxed{x = 36}$$

x x

36 -5

مرفوض