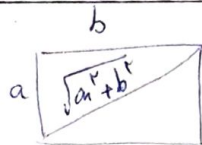


نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره ۱.۸.۱ کلاس
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$$\frac{1+\sqrt{5}}{2} = \frac{x}{r} = \frac{\sqrt{5}+1}{2} \Rightarrow x = r(\sqrt{5}+1)$$

$$\frac{S_2}{S_1} = \frac{r \cdot r(\sqrt{5}+1)}{r \times 5} = \frac{1}{5}(\sqrt{5}+1)$$

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$$\frac{\sqrt{a^2+b^2}}{b} = \frac{\sqrt{5}+1}{2} \Rightarrow \frac{a^2+b^2}{b^2} = \frac{5+2\sqrt{5}+1}{4} = \frac{6+2\sqrt{5}}{4} = \frac{3+\sqrt{5}}{2}$$

$$\left(\frac{a}{b}\right)^2 + 1 = \frac{3+\sqrt{5}}{2} \Rightarrow \left(\frac{a}{b}\right)^2 = \frac{2+\sqrt{5}}{2} \Rightarrow \left(\frac{b}{a}\right)^2 = \frac{2}{2+\sqrt{5}} = \frac{2}{1+\sqrt{5}}$$

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$$3a + \sqrt{4a^2 + 9a} = r$$

$$\sqrt{4a^2 + 9a} = r - 3a \quad (*)^2$$

$$4a^2 + 9a = r^2 - 6ra + 9a^2 \Rightarrow$$

$$5a^2 - 6ra + r^2 = 0$$

$$\Delta = 36r^2 - 112 = 144 \Rightarrow x_1, x_2 = \frac{14 \pm 12}{14}$$

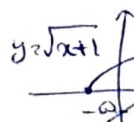
$$\frac{a+1}{a} = \frac{\frac{r}{\sqrt{5}} + 1}{\frac{r}{\sqrt{5}}} = \frac{r + \sqrt{5}}{r} = \frac{7}{2} = 3.5$$

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$$\frac{\sqrt{x+1} (r - \sqrt{x-1}) - \sqrt{x+1} (\sqrt{x-1} + r)}{(r + \sqrt{x-1})(r - \sqrt{x-1})} = \frac{(\sqrt{x-1} - 1)^2}{x-1} = 0$$

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

$$\Rightarrow \sqrt{x-1} \neq 0 \Rightarrow \sqrt{x+1} = \frac{r^2 - x + 1}{2}$$



این تابع را می‌توانیم از روی نمودار نیز بررسی کنیم. از آنجا که این تابع صعودی است و از (-1, 0) شروع می‌کند، پس برای هر x > -1، y > 0 خواهد بود.

$$\sqrt{r-x} = a \Rightarrow \frac{1}{a+r} - \frac{1}{r-a} = \frac{a^2}{5a} = 0 \Rightarrow \frac{-r}{r-a^2} = \frac{a}{5} \Rightarrow$$

$$r - a^2 = -10 \Rightarrow a^2 = 14 \Rightarrow r - x = 14 \Rightarrow x = -12$$

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$$\frac{1}{x^2} + \frac{1}{(1-x)^2} = \frac{14}{9} \Rightarrow \left(\frac{1}{x} + \frac{1}{1-x} \right)^2 - 2 \left(\frac{1}{x(1-x)} \right) = \frac{14}{9} \Rightarrow$$

$$\frac{1}{x} - \frac{1}{1-x} = \frac{14}{9} \Rightarrow \frac{1}{x} - \frac{1}{1-x} + \frac{1}{1-x} = \frac{14}{9} + \frac{1}{1-x}$$

$$\left(\frac{1}{x(1-x)} \right)^2 - 2 \left(\frac{1}{x(1-x)} \right) = \frac{14}{9} \Rightarrow \left(\frac{1}{x(1-x)} \right)^2 - 2 \left(\frac{1}{x(1-x)} \right) + 1 = \frac{14}{9} + 1$$

$$\begin{cases} t-1 = \frac{14}{9} \Rightarrow t = \frac{23}{9} \\ t-1 = -\frac{14}{9} \Rightarrow t = -\frac{5}{9} \end{cases} \quad \frac{1}{x(1-x)} = \frac{14}{9} \Rightarrow -x^2 + x = \frac{14}{9} \Rightarrow S_1$$

$$\frac{1}{x(1-x)} = -\frac{14}{9} \Rightarrow -x^2 + x = -\frac{14}{9} \Rightarrow S_1 + S_2 = 1$$

$$\sqrt{x} + \sqrt{-x^2 + 14x - 10} + \sqrt{x^2 + \sqrt{-x^2 + 14x - 10} - 1} = x + 2$$

$$\Rightarrow \sqrt{x} + \sqrt{-x^2 + 14x - 10} + \sqrt{x^2 + \sqrt{-x^2 + 14x - 10} - 1} = x + 2 \Rightarrow$$

$$\sqrt{x} + \sqrt{(x-1)(14-x-10)}$$

$$x=1 \quad (14-x-10) = 4 \Rightarrow x=1$$

$$x=1$$

$$-10 - 14 + 14 = -10 \Rightarrow [1, +\infty) \cup \{-10\}$$

$$\Rightarrow x=1 \text{ is the only solution}$$

$$K = \frac{1}{10} \frac{1}{x^2}$$

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

$$\Rightarrow A = (-2, 2) \quad B = (1, 1)$$

$$3y + x = 14$$

$$|AB| = \sqrt{(2+1)^2 + (1-2)^2} = \sqrt{10}$$

$$\begin{cases} 3y + x = 14 \\ y - 2x = 1 \end{cases} \Rightarrow (x+1) = -x+14 \Rightarrow 4x+1 = -x+14 \Rightarrow 5x=13 \Rightarrow x=\frac{13}{5}$$

$$\begin{cases} 3y + x = 14 \\ y = 2 \end{cases} \Rightarrow \text{O.S.}$$

$$\begin{cases} 3y + x = 14 \\ 3x + y = -1 \end{cases} \Rightarrow \begin{matrix} -x+14 = 3(-3x-1) \\ -x+14 = -9x-3 \end{matrix} \Rightarrow \begin{matrix} 8x = -17 \\ x = -\frac{17}{8} \end{matrix}$$

$$y = 2$$

$$y = \sqrt{x^2 - 14x + 14}$$

$$y = \sqrt{(x-7)^2} \Rightarrow y = |x-7|$$

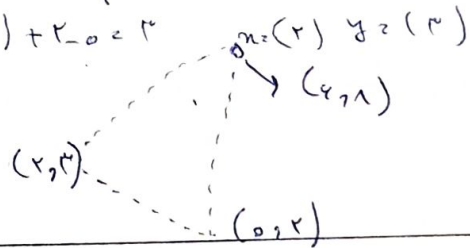
$$\begin{cases} y = x-7 \\ y = \frac{1}{2}x+7 \end{cases} \Rightarrow y=7 \quad x=14$$

$$\begin{cases} y = x+7 \\ y = \frac{1}{2}x+7 \end{cases} \Rightarrow y=14 \quad x=7$$

$$m = \frac{7-14}{14-7} = -\frac{1}{2} \Rightarrow y = -\frac{1}{2}x+7 \quad L = (7)(14) + 14 = 112$$

$$\text{Area of triangle} = \frac{1}{2}bh = \frac{1}{2} \times 14 \times 14 = 98$$

$$S_{\Delta} = \frac{1}{2}bh = \frac{1}{2} \times 14 \times 14 = 98$$



$$\frac{1}{x} + \frac{1}{x+9} = \frac{1}{x} \Rightarrow \frac{x+9}{x(x+9)} = \frac{1}{x} \Rightarrow$$

$$x+9 = x+9 \Rightarrow x+9 = x+9$$

$$\frac{1}{x} + \frac{1}{x+9} = \frac{1}{x} \Rightarrow \frac{x+9}{x(x+9)} = \frac{1}{x} \Rightarrow$$

$$x+9 = x+9 \Rightarrow x+9 = x+9$$

$$x^2 - 91x = 180 \Rightarrow$$

$$x(x-91) = 180 \Rightarrow x = 92$$