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$$\frac{L}{r_m} = \frac{\omega}{r}$$

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①

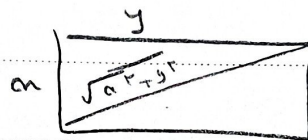
$$\frac{L}{r_m} = \frac{\omega}{r}$$

$$S_{\text{چپ}} = f_{\text{ax}} \times \omega r$$

$$S_{\text{راست}} = f_{\text{ax}} \times r_m (\sqrt{\omega} + 1)$$

$$\frac{f_{\text{ax}} \times r_m (\sqrt{\omega} + 1)}{f_{\text{ax}} \omega r} = \frac{1}{r} (\sqrt{\omega} + 1)$$

$$\frac{L}{r_m} = \frac{\omega}{r}$$



②

$$\frac{\sqrt{a^2 + y^2}}{y} = \frac{\sqrt{\omega} + 1}{r} \rightarrow \frac{a^2 + y^2}{y^2} = \frac{y + r\sqrt{\omega}}{r}$$

$$ra^2 + ry^2 = ry^2 + y^2\sqrt{\omega} \rightarrow a^2 = y^2 \left(\frac{1 + \sqrt{\omega}}{r} \right) \rightarrow \frac{y^2}{a^2} = \frac{\sqrt{\omega} - 1}{r}$$

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

$$\frac{a+1}{a}$$

③

$$ra^2 + r = a^2r + r - 1ra \rightarrow va^2 + r - 1ra = 0 \rightarrow \Delta = 1r^2$$

$$a = \frac{1r \pm r}{1r} \rightarrow a = \frac{r}{r}, \frac{r}{r}$$

$$\frac{\frac{r}{r} + \frac{r}{r}}{\frac{r}{r}} = \frac{a}{r} = \frac{1}{r}$$

$$\frac{\sqrt{a+1}}{\sqrt{a-1} + r} - \frac{\sqrt{a+1}}{r - \sqrt{a-1}} = \frac{a-1}{\sqrt{a-1}}$$

④

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

$$a - (a-1)$$

$$1 = a$$

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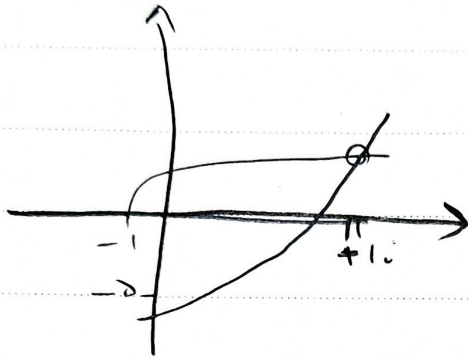
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$$\frac{-r\sqrt{a^2-1}}{1-m} = \sqrt{a-1} \rightarrow -r\sqrt{a-1} \sqrt{a+1} = (1-m)\sqrt{a-1}$$

$$\sqrt{a-1} \neq 0$$

$$-r\sqrt{a+1} = 1-m \rightarrow \sqrt{a+1} = \frac{1-m}{r} \rightarrow \dots$$



$$\frac{1}{\frac{1}{\sqrt{r-m}} + r} - \frac{1}{r - \sqrt{r-m}} = \frac{r-m}{\omega\sqrt{r-m}}$$

$$\frac{1}{\epsilon + r} - \frac{1}{r - \epsilon} = \frac{-r\epsilon}{r - \epsilon^2} \quad \frac{r-m}{\omega\sqrt{r-m}} = \frac{\epsilon r}{\omega\epsilon} = \frac{r}{\omega}$$

$$\frac{-r\epsilon}{r - \epsilon^2} = \frac{r}{\omega} \rightarrow -1 = \frac{r - \epsilon^2}{r} \rightarrow -1 = m + r \rightarrow m = -1r \rightarrow \dots$$

$$\frac{1}{mr} + \frac{1}{(1-m)r} = \frac{14}{9} \quad m = \frac{1}{r} + \epsilon$$

$$\frac{1}{(\frac{1}{r} + \epsilon)r} + \frac{1}{(\frac{1}{r} - \epsilon)r} = \frac{14}{9} \rightarrow \frac{\frac{1}{r} + \epsilon^2 - \epsilon + \frac{1}{r} + \epsilon^2 + \epsilon}{(\frac{1}{r} - \epsilon^2)r}$$

$$\frac{r(\frac{1}{r} + \epsilon^2)}{(\frac{1}{r} - \epsilon^2)r} = \frac{14}{9} \rightarrow \frac{1}{1 - \epsilon^2 r^2} = \frac{14}{9} \rightarrow 1 - \epsilon^2 r^2 = \frac{9}{14} \rightarrow \epsilon^2 r^2 = \frac{5}{14} \rightarrow \epsilon = \pm \frac{\sqrt{70}}{14}$$

$$\epsilon^2 = \frac{14 \pm 14}{40} \rightarrow \epsilon = \pm \frac{1}{r}, \quad \frac{\pm \sqrt{70}}{14}$$

$$\boxed{r} = \epsilon^2$$

$$\sqrt{a + \sqrt{-ar^2 + 4ar + r^2d} - 1} + \sqrt{ar^2 + \sqrt{-ar^2 + 4ar - 1}} = a + r$$

$$-(a-r)(ar^2 - r^2d) \geq -(a-r)(a-d)(a+d) \geq 0$$

$$(a-r)(a-d)(a+d) \leq 0$$

$$(II) a \in (-\infty, -d] \cup [r, \infty)$$

$$-ar^2 + 4ar - 1 = -(a-r)(a-d) \geq 0 \rightarrow (a-r)(a-d) \leq 0$$

$$I \cap II = \{r\} \xrightarrow{a=r} \sqrt{r^2 + 5} + \sqrt{14 + 5} = r + c = 4$$

$$y = |a+r| + |a-1|$$

$$ry + a \leq 1$$

$$ra+1 \quad a \geq 1$$

$$r \quad -r \leq a \leq 1$$

$$-ra-1 \quad a \leq -r$$

$$\rightarrow ra+1 = \frac{1v-a}{r} \rightarrow a=r, y=1$$

$$\rightarrow -ra-1 = \frac{1v-a}{r} \rightarrow a=-r$$

$$AB = \sqrt{(r+r)r + (d-v)r} = r\sqrt{1}$$

$$A = (-r, v)$$

$$y = \sqrt{ar^2 - ra + c}$$

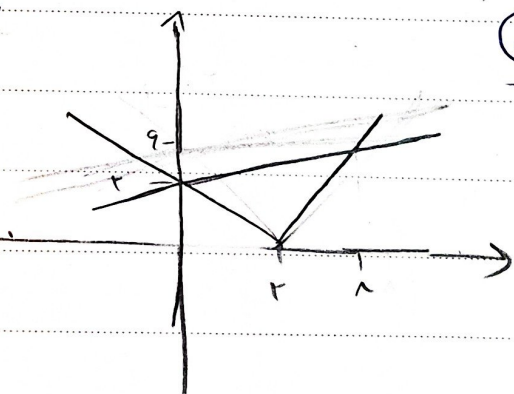
$$y = \frac{1}{r}ar + r$$

$$y = |a-r|$$

$$a \geq r$$

$$a-r = \frac{1}{r}a + r \rightarrow a=r, y=r$$

$$r-a = \frac{1}{r}a + r \rightarrow a=r, y=r$$



$$r \quad 0 \quad 1$$

$$0 \quad r \quad 1$$

$$1 \quad 4 \quad 1$$

$$\rightarrow \frac{1}{r}(14 + 1r + 0 - r - 0 - 0) = 1r$$

$$rc$$

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$$\left. \begin{aligned} \frac{1}{B} + \frac{1}{E} &= \frac{1}{F} \\ B + 9 &= F \end{aligned} \right\} \rightarrow \frac{1}{B} + \frac{1}{B+9} = \frac{1}{F}$$

$$\frac{\overset{+9}{B} + \overset{+9}{B} + 9}{B(B+9)} = \frac{1}{F} \rightarrow B^2 + 9B = E \cdot B + 11$$

$$B^2 - 11B - 11 = 0 \rightarrow \Delta = 121 \rightarrow B = \frac{11 \pm 11}{2} = \frac{22}{2} = 11$$