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$$A \Rightarrow x + r(rk - 1) = r \Rightarrow rk = 1; y = 1 \Rightarrow A(1, 1), B = x + y^2; x + ry = r \Rightarrow y = -1, x = \omega \quad B(\omega, -1)$$

$$C \Rightarrow x + rk - 1 = \varepsilon \Rightarrow k = \frac{\omega}{r}; y = \frac{v}{r} \Rightarrow C\left(\frac{\omega}{r}, \frac{v}{r}\right) \Rightarrow M\left(\frac{\omega + \frac{\omega}{r}}{r}, \frac{-1 + \frac{v}{r}}{r}\right) = \left(\frac{1}{r}, \frac{r}{r}\right) \Rightarrow AM =$$

$$\sqrt{\left(\frac{1}{r} - 1\right)^2 + \left(\frac{r}{r} - 1\right)^2} \Rightarrow \sqrt{\frac{\omega^2}{r^2}} = \frac{\omega + \sqrt{r}}{r} \Rightarrow AH = \frac{|1 + 1 - \varepsilon|}{\sqrt{\frac{r}{r^2}}} \Rightarrow \sqrt{r} \Rightarrow \frac{AM}{AH} = \frac{\frac{\omega + \sqrt{r}}{r}}{\sqrt{r}} = \frac{\omega}{r} \checkmark$$

$$\frac{1}{r}x + y - b = 0 \Rightarrow d = \frac{|Ax_0 + By_0 + c|}{\sqrt{A^2 + B^2}} \Rightarrow \frac{|-b|}{\sqrt{\left(\frac{1}{r}\right)^2 + 1}} = \sqrt{r} \Rightarrow |b| = \sqrt{r \cdot \frac{\omega}{\varepsilon}} \Rightarrow b = \pm \omega \Rightarrow A(0, \omega)$$

$$A(0, \omega), B(1, 0) \Rightarrow B(-1, 0) \Rightarrow AB = \sqrt{(\omega)^2 + (1.0)^2} \Rightarrow \omega \sqrt{\omega} \checkmark$$

$$my - \varepsilon k = rm, y + mk = k + r \Rightarrow m(x(1-m) + r) - \varepsilon k = rm \Rightarrow mx - m^2x - \varepsilon k = 0 \Rightarrow x(m - m^2 - \varepsilon) = 0$$

$$k = 0 \Rightarrow y = r \Rightarrow P(0, r) \xrightarrow{\text{نقطة على الخط}} -\varepsilon k = rm \Rightarrow x_1 = \frac{-m}{r}, x(m-1) = r \Rightarrow k_r = \frac{r}{m-1}$$

$$\text{مسافة} = \left| \frac{r}{m-1} - \left(-\frac{m}{r}\right) \right| = \left| \frac{r}{m-1} + \frac{m}{r} \right| \Rightarrow \text{مسافة} = \frac{1}{r} \times \left| \frac{r}{m-1} + \frac{m}{r} \right| \times r \Rightarrow \left| \frac{r}{m-1} + \frac{m}{r} \right| = \frac{\omega}{r}$$

$$\left| \frac{r}{m-1} + m \right| = \omega \Rightarrow \frac{r}{m-1} + m = \omega \Rightarrow m = r \xrightarrow{\text{علاقة}} \frac{r}{m-1} + m = \omega \Rightarrow m^2 + \varepsilon m - 1 \Rightarrow m = -r - \sqrt{\omega} \leq m = -r + \sqrt{\omega} \Rightarrow -r \checkmark$$

$$x = 0 \Rightarrow A(0, -r) \xrightarrow{x=1} B(1, -1) \xrightarrow{\text{نقطة على الخط}} A(0, r) \Rightarrow A'(\varepsilon, -1), B(1, -1) \Rightarrow B'(\frac{r}{\varepsilon}, -r)$$

$$m_{A'B'} = \frac{-r - (-1)}{r - \varepsilon} = r \Rightarrow y + 1 = r(x - \varepsilon) \Rightarrow y = rx - r \checkmark$$

$$y = x + \omega, m = 1 \xrightarrow{m=1} -1 \Rightarrow y - r = -1(x - 1) \Rightarrow y = -x + r \Rightarrow x + y = -x + r \Rightarrow rk = -r$$

$$k = -1, y = r \Rightarrow F(-1, \varepsilon) \Rightarrow A'(a, b) \Rightarrow \frac{1+a}{r} = -1 \Rightarrow a = -r, \frac{r+b}{r} = \varepsilon \Rightarrow b = r$$

وسط بين نقطتين

$$A'(-r, r) \Rightarrow rb - a \Rightarrow r(r) - (-r) = r\omega \checkmark$$