

۱۸,۵

①

$$1 \text{ الف) } \left| \begin{array}{cc} 1 & 5 \\ 2 & -1 \end{array} \right| \quad m = \frac{1 - (-1)}{2 - 5} = -\frac{2}{3}$$

$$3 \quad y - y_A = m(x - x_A) \rightarrow -\frac{2}{3}(x - 5) = y - 1$$

$$4 \quad \rightarrow y = -\frac{2}{3}x + 11$$

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$$5 \quad \text{ب) } 2y + 5x = -1 \rightarrow m = \frac{-5}{2} = -\frac{5}{2}$$

$$6 \quad -\frac{5}{2}(x - 5) = y - 2 \quad -\frac{5}{2}x + 1\frac{5}{2} = y$$

$$7 \quad \text{ج) } x + 3y = 1 \quad m = -\frac{1}{3} \rightarrow m_{AH} = 3$$

$$8 \quad A \left| \begin{array}{cc} 1 & 3 \\ 2 & -1 \end{array} \right| \quad 3(x - 5) = y - 2 \quad y = 3x - 13$$

$$9 \quad \text{د) } \tan \frac{\pi}{4} = \sqrt{3} \quad y = \sqrt{3}x + b \quad \left| \begin{array}{cc} 1 & \sqrt{3} \\ 2 & -1 \end{array} \right|, \quad 1 = \sqrt{3}(2) + b$$

$$\Rightarrow b = 1 - 2\sqrt{3}$$

$$11 \quad y = \sqrt{3}x + \underbrace{1 - 2\sqrt{3}}_{-4\sqrt{3} + 1}$$

②

$$13 \quad \text{الف) } \sqrt{(x - x_A)^2 + (y - y_A)^2} = \sqrt{(2+1)^2 + (3-1)^2}$$

$$14 \quad = \sqrt{1+4} = \sqrt{5}$$

$$15 \quad \text{ب) } 3x + 4y = 3 \rightarrow \frac{|3(2) + 4(3) - 3|}{\sqrt{3^2 + 4^2}} = \frac{15}{5} = 3$$

$$17 \quad 1x + 5y = 1 \quad 2x + 3y = 5 \quad 1x + 5y = 12$$

③

$$18 \quad \text{الف) } 1x + 5y = \frac{1+12}{5} = 10 \rightarrow 1x + 5y = 10$$

$$19 \quad \text{ب) } d = \frac{|1(-1) - 5(2)|}{\sqrt{1^2 + 5^2}} = \frac{|-11|}{\sqrt{1+25}} = \frac{11}{\sqrt{26}} = \frac{11\sqrt{26}}{26}$$

$$rx - ry = 1 \quad rx + ry = r$$

(5)

$$\frac{|rx - ry - 1|}{\sqrt{r^2 + r^2}} = \frac{|rx + ry - r|}{\sqrt{r^2 + r^2}}$$

$$rx - ry - 1 = rx + ry - r \Rightarrow x - y = -r$$

$$rx - ry - 1 = -rx - ry + r \Rightarrow x + y = r$$

$$y + rx = r \rightarrow m = -r$$

(a)

$$y - rx = a \rightarrow m' = r$$

$$\tan \alpha = \left| \frac{m - m'}{1 + mm'} \right|$$

$$\Rightarrow \tan \alpha = 1 \quad \alpha = 45^\circ$$

$$= \left| \frac{r - (-r)}{1 - r^2} \right| = 1$$

$$A \left| \begin{matrix} r \\ -r \end{matrix} \right| \quad B \left| \begin{matrix} -a \\ r \end{matrix} \right|$$

(5)

$$i) d = \sqrt{(x_B - x_A)^2 + (y_B - y_A)^2} = \sqrt{r^2 + (-1)^2} = \sqrt{r^2 + 1} = 10$$

$$ii) x = \frac{x_B + x_A}{r} \Rightarrow \frac{r - a}{r} = -1$$

$$y = \frac{y_B + y_A}{r} \Rightarrow \frac{r - r}{r} = 1$$

$$\begin{vmatrix} -1 \\ 1 \end{vmatrix}$$

$$iii) x = \frac{x_A + x_B + x_C}{r} = \frac{-10 - r + r}{r} = -1$$

$$y = \frac{y_A + y_B + y_C}{r} = \frac{-1r + r + 1}{r} = -1$$

$$iv) \frac{1}{r} \begin{vmatrix} r & 1 & 1 \\ -r & r & 1 \\ -10 & -1r & 1 \end{vmatrix} = \frac{r + r^2 - 10 + r^2 + r^2 + r}{r}$$

$$= \frac{r^2}{r} = r$$

$$y = \frac{r_n + 1}{r_n - r}$$

الف) $-y = \frac{r_n + 1}{r_n - r} \Rightarrow y = \frac{-r_n - 1}{r_n - r}$ لا نستخدم

ب) $-x \rightarrow y = \frac{-r_n + 1}{-r_n - r}$

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ج) $y = x \Rightarrow y = \frac{r_n + 1}{r_n - r}$

د) $-y = \frac{-r_n + 1}{-r_n - r} \Rightarrow y = \frac{r_n - 1}{r_n + r} \Rightarrow y = \frac{-r_n - 1}{r_n - r}$

$-x = \frac{-y + 1}{-r_n - r} \Rightarrow y = -\frac{r_n - 1}{r_n + r}$

الف) $\begin{cases} x' = x - r \\ y' = y + r \end{cases} \Rightarrow x = x' + r$ $y = \frac{r_n + 1}{x - r}$ (9)

$y' - r = \frac{r(x' + r) + 1}{x' - 1} = \frac{rx' + r^2 + 1}{x' - 1}$

$\rightarrow \frac{rx' + r^2 + 1}{x' - 1} = \frac{rx' + r}{x' - 1}$

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ب) $\begin{cases} x' = x - r \\ y' = y - r \end{cases} \Rightarrow x = x' + r$

$y' = y - r \Rightarrow y = y' + r$

$y' + r = \frac{r(x' + r) + 1}{x' + r - r} = \frac{rx' + r^2 + 1}{x'}$

$\frac{rx' + r^2 + 1}{x'} = \frac{rx' + r}{x'}$

$$\text{ii)} \begin{cases} rx + ry = r \\ x(x - ay = 1) \end{cases} \begin{cases} rx + ry = r \\ -rx + 1ay - r \\ 19y = -1 \\ y = \frac{-1}{19} \rightarrow x = \frac{1r}{19} \end{cases} \quad (b)$$

$$\rightarrow \begin{cases} rx + ry = r \\ x - ay = 1 \end{cases} \quad (5)$$

$$x = - \frac{r + 10}{-10 - 1r} = \frac{1r}{19}$$

$$y = \frac{r - r}{-10 - r} = \frac{+1}{-19}$$