

الف) $m = \frac{\Delta y}{\Delta x} = \frac{-2-2}{0-4} = -1$ معادله خط: $y = -x + c$ از نقطه $(4, 2)$ میگذرد: $2 = -4 + c \Rightarrow c = 6$

ب) با خط $x + 4y = 1$ موازی باشد: $m = \frac{-a}{b} = \frac{-1}{4} = -\frac{1}{4}$ معادله خط: $y = -\frac{1}{4}x + c$ از نقطه $(4, 2)$ میگذرد: $2 = -1 + c \Rightarrow c = 3$

ج) بر خط $x + 2y = 1$ عمود باشد: $m' = 2$ معادله خط: $y = 2x + c$ از نقطه $(4, 2)$ میگذرد: $2 = 8 + c \Rightarrow c = -6$

د) زاویه $\tan \alpha = \sqrt{3} \Rightarrow \alpha = \frac{\pi}{3}$ معادله خط: $y = \sqrt{3}x + c$ از نقطه $(2, -4\sqrt{3})$ میگذرد: $-4\sqrt{3} = 2\sqrt{3} + c \Rightarrow c = -6\sqrt{3}$

الف) $d = \sqrt{(7-2)^2 + (-1-2)^2} = 5$ فاصله: $d = \frac{|2 \times 2 + 4 \times (-1) - 4|}{\sqrt{2^2 + 4^2}} = \frac{2}{5}$

الف) $2x + 3y - 9$, $4x + 4y - 1$ معادله خط موازی: $2x + 4y = 10 \Rightarrow 2x + 3y - 8 = 0$
 $d = \frac{|c - c'|}{\sqrt{a^2 + b^2}} = \frac{|10 - 1|}{\sqrt{2^2 + 4^2}} = \frac{9}{\sqrt{20}} = \frac{9\sqrt{5}}{10}$

دو خط متقاطع هستند: $\frac{2}{1} \neq \frac{-2}{-1}$
 $\frac{|2x - 2y - 1|}{\sqrt{4+4}} = \frac{|2x + 2y - 2|}{\sqrt{4+4}} \Rightarrow x - y + 1 = 0$
 $\frac{|2x - 2y - 1|}{\sqrt{4+4}} = \frac{|-2x - 2y + 2|}{\sqrt{4+4}} \Rightarrow x + y - 1 = 0$

دو خط متقاطع هستند: $\tan \alpha = \frac{|m - m'|}{|1 + mm'|} = \left| \frac{2 - (-2)}{1 + (-4)} \right| = 1 \Rightarrow \alpha = \frac{\pi}{4}$
 $y + 2x - 2 = 0 \Rightarrow m = -2$
 $y - 2x - 8 = 0 \Rightarrow m = 2$

الف) $d = \sqrt{(-2-4)^2 + (2-(-5))^2} = 10$ فاصله: $x = \frac{4-5}{2} = -\frac{1}{2}$, $y = \frac{-2+4}{2} = 1$ از نقطه $A(-1, 1)$ میگذرد: $d = \sqrt{(-2-4)^2 + (2-(-5))^2} = 10$

الف) $x = \frac{4-2-1 \cdot 0}{2} = -\frac{1}{2}$, $y = \frac{1+2+(-1) \cdot 3}{2} = -\frac{1}{2}$ از نقطه $A(-2, -2)$ میگذرد: $d = \frac{(4+24-10) - (-2 \cdot -2 - 2 - 2 \cdot 2)}{2} = 11$

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

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

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

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

(ج)

$$rny - ry = r_{n+1} \Rightarrow y(r_n - r) = r_{n+1} \Rightarrow y = \frac{r_{n+1}}{r_n - r}$$

(٥)

$$-x = \frac{-ry + 1}{-ry - r} = rny + r_n = -ry + 1 \rightarrow rny + ry = 1 - r_n$$

(٦)

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

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

$$\begin{aligned} x' &= x - r & x &= x' + r \\ y' &= y + r & y &= y' - r \end{aligned}$$

A (r, -r) (الف) ٩

$$y' - r = \frac{r_{n+1} + r + 1}{x' + r - r} \Rightarrow y' - r = \frac{r_{n+1} + 1}{x' - 1} \Rightarrow y' = \frac{r_{n+1} + 1}{x' - 1}$$

(٥)

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

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

$$y' + r = \frac{r_{n+1} + r + 1}{x' + r - r} \Rightarrow y' = \frac{r_{n+1} + 1}{x' - 1}$$

A (r, r) (ب)

$$\begin{cases} r_n + ry = r \\ n - 5y = 1 \end{cases}$$

$$\xrightarrow{\text{ضرب (الف) في 5}} \begin{cases} r_n + ry = r \\ r_n - 10y = 5 \end{cases}$$

$$19y = -1 \Rightarrow y = \frac{-1}{19} \quad x = \frac{14}{19}$$

(١, ٧٥)

$$\Rightarrow x = \frac{\begin{vmatrix} r & r \\ -5 & 1 \end{vmatrix}}{\begin{vmatrix} r & r \\ 1 & -5 \end{vmatrix}} = \frac{r - (-1)}{-10 - r} = \frac{14}{-19}$$

$$y = \frac{\begin{vmatrix} r & r \\ 1 & 1 \end{vmatrix}}{\begin{vmatrix} r & r \\ 1 & -5 \end{vmatrix}} = \frac{r - r}{-10 - r} = \frac{1}{-19}$$