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(الف)

$$m = \frac{-2-2}{-5-2} = \frac{-4}{-7} = \frac{4}{7}$$

$$y - y_0 = m(u - u_0) \Rightarrow y + 2 = \frac{4}{7}(u - 5) \Rightarrow y = -\frac{4}{7}u + \frac{20}{7} + 2 \Rightarrow y = -\frac{4}{7}u + \frac{34}{7} \rightarrow \text{جواب}$$

$$\text{باید} \Rightarrow m = m' \Rightarrow m = \frac{-2}{-5} = \frac{2}{5} = m' \Rightarrow y - y_0 = m(u - u_0) \Rightarrow y - 2 = \frac{2}{5}(u - 2) \Rightarrow y = \frac{2}{5}u - \frac{4}{5} + 2 \Rightarrow y = \frac{2}{5}u + \frac{6}{5} \rightarrow \text{جواب}$$

$$y = -\frac{4}{7}u + \frac{34}{7} \Rightarrow y = -\frac{4}{7}u + \frac{34}{7} \rightarrow \text{جواب}$$

$$\text{باید} \Rightarrow m m' = -1 \Rightarrow m = -\frac{1}{m'} = -\frac{1}{\frac{2}{5}} = -\frac{5}{2} \Rightarrow y - y_0 = m(u - u_0) \Rightarrow y - 2 = -\frac{5}{2}(u - 2) \Rightarrow y = -\frac{5}{2}u + 5 + 2 \Rightarrow y = -\frac{5}{2}u + 7 \rightarrow \text{جواب}$$

$$\tan \alpha = m = \frac{2}{5} \Rightarrow \tan \alpha = \frac{2}{5} \Rightarrow y - y_0 = m(u - u_0) \Rightarrow y - 2 = \frac{2}{5}(u - 2) \Rightarrow y = \frac{2}{5}u - \frac{4}{5} + 2 \Rightarrow y = \frac{2}{5}u + \frac{6}{5} \rightarrow \text{جواب}$$

$$AB = \sqrt{(5y)^2 + (5u)^2} \Rightarrow d = \sqrt{(5y)^2 + (5u)^2} = 5 \rightarrow \text{جواب}$$

$$d = \frac{|au_0 + by_0 + c|}{\sqrt{a^2 + b^2}} \Rightarrow d = \frac{|3(2) + (2 \times 3) - 3|}{\sqrt{(3)^2 + (2)^2}} = \frac{10}{\sqrt{13}} = \frac{10\sqrt{13}}{13} \rightarrow \text{جواب}$$

$$3u + 2y - 3 = 0 \Leftrightarrow 3u + 2y = 3$$

$$\frac{c+c'}{r} = au + by \Rightarrow 2u + 4y = \frac{1+12}{2} \Rightarrow 2u + 4y = 13 \rightarrow \text{جواب}$$

$$2u + 3y = 4, \quad 2u + 4y = 13 \rightarrow \text{جواب}$$

$$2u + 4y = 13$$

$$2(2u + 3y = 4) \Rightarrow 4u + 6y = 8$$

$$4u + 6y = 8 \Rightarrow 2u + 3y = 4$$

$$\text{فاصله} = d = \frac{|c - c'|}{\sqrt{a^2 + b^2}} \Rightarrow \frac{|12 - 1|}{\sqrt{2^2 + 4^2}} = \frac{11}{\sqrt{20}} = \frac{11}{2\sqrt{5}} = \frac{11\sqrt{5}}{10} \rightarrow \text{جواب}$$

$$\begin{cases} 2u + 4y = 13 \\ 2(2u + 3y = 4) \\ 4u + 6y = 8 \end{cases} \rightarrow \text{جواب}$$

$$3u + 2y = 3, \quad 3u - 2y = 1$$

$$\frac{|au + by - c|}{\sqrt{a^2 + b^2}} = \frac{|a'u + b'y - c'|}{\sqrt{(a')^2 + (b')^2}}$$

$$\Rightarrow \frac{|3u + 2y - 3|}{\sqrt{3^2 + 2^2}} = \frac{|3u - 2y - 1|}{\sqrt{3^2 + 2^2}} \Rightarrow |3u + 2y - 3| = |3u - 2y - 1| \Rightarrow 3u + 2y - 3 = 3u - 2y - 1 \Rightarrow 4y = 2 \Rightarrow y = \frac{1}{2}$$

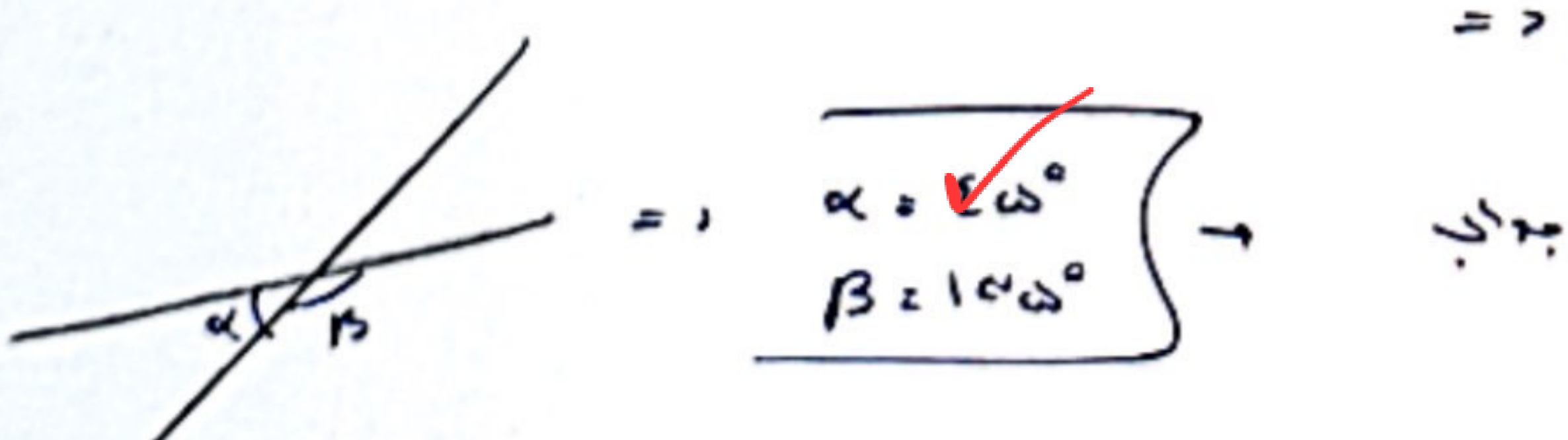
$$-u + 5y = 2 \Rightarrow y = -\frac{1}{5}u + \frac{2}{5} \rightarrow \text{جواب}$$

برای یافتن معادله خط متقاطع
از رابطه دو خط دو نقطه:

$$\frac{|au + by - c|}{\sqrt{a^2 + b^2}} = \frac{|a'u + b'y - c'|}{\sqrt{(a')^2 + (b')^2}}$$

$$\tan \alpha = \left| \frac{m - m'}{1 + mm'} \right| \Rightarrow \tan \alpha = \left| \frac{\frac{2}{5} - \frac{4}{7}}{1 + \frac{2}{5} \cdot \frac{4}{7}} \right| = 1 \Rightarrow \alpha = \frac{\pi}{4} = 45^\circ$$

$$\beta = 180^\circ - \alpha \Rightarrow \beta = 180^\circ - 45^\circ = 135^\circ$$



زاویه بین دو خط متقاطع با شیب های
m و m' از فرمول زیر:

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

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$$AB = \sqrt{(\Delta y)^2 + (\Delta u)^2} \Rightarrow AB = \sqrt{\left(\frac{-2-1}{34}\right)^2 + \left(\frac{0-(-5)}{46}\right)^2} = \sqrt{100} = 10 \rightarrow \text{جواب}$$

$$M \begin{cases} \frac{u_A + u_B}{2} = \frac{-u + 0}{2} = -1 \\ \frac{y_A + y_B}{2} = \frac{2-2}{2} = 1 \end{cases} \Rightarrow M(-1, 1) \text{ که جواب}$$

ب 5

$$G \begin{cases} \frac{u_A + u_B + u_C}{3} \\ \frac{y_A + y_B + y_C}{3} \end{cases} \Rightarrow G \begin{cases} \frac{u - 10 - 2 + 0}{3} = -4 \\ \frac{y - 10 + 2 + 1}{3} = -3 \end{cases} \Rightarrow G(-3, -3) \text{ که جواب}$$

$$S = \frac{1}{2} \begin{vmatrix} -10 & -2 & 3 \\ -13 & 3 & 1 \\ 1 & 1 & 1 \end{vmatrix} \Rightarrow \frac{1}{2} \left(\frac{-30 - 2 - 39}{-21} - \frac{(1 - 10 + 24)}{21} \right) = \frac{1}{2} | -24 | = \frac{1}{2} \times 24 = 12 \text{ که جواب}$$

چون مساحت مثلث است

$$y = \frac{2u+1}{2u-3} \Rightarrow -y = \frac{2u+1}{2u-3} \Rightarrow \text{جواب}$$

$$y = \frac{2u+1}{2u-3} \Rightarrow y = \frac{-2u+1}{-2u-3} \Rightarrow \text{جواب}$$

$$y = \frac{2u+1}{2u-3} \Rightarrow u = \frac{2y+1}{2y-3} \Rightarrow y = \frac{-3u-1}{2-2u} \Rightarrow y = \frac{-(3u+1)}{-(-2+2u)} \Rightarrow y = \frac{3u+1}{2u-2} \Rightarrow \text{جواب}$$

$$y = \frac{2u+1}{2u-3} \Rightarrow -u = \frac{-2y+1}{-2y-3} \Rightarrow y = \frac{3u-1}{-2u-2} \Rightarrow y = \frac{-3u+1}{2u+2} \text{ که جواب}$$

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$$\text{الف) } \begin{cases} y = \frac{2u+1}{u-3} \\ u' = u-2 \Rightarrow u' = u-2 \Rightarrow u = u'+2 \\ y' = y-2 \Rightarrow y' = y+3 \Rightarrow y = y'-3 \end{cases}$$

$$y = \frac{2u+1}{u-3} \Rightarrow y' - 3 = \frac{2(u'+2)+1}{(u'+2)-3} \Rightarrow y' - 3 = \frac{2u'+5}{u'-1} \Rightarrow y' = \frac{2u'+5}{u'-1} + 3 \Rightarrow y' = \frac{2u'+5+3u'-3}{u'-1} = \frac{5u'+2}{u'-1}$$

$$\text{ب) } \begin{cases} y = \frac{2u+1}{u-3} \Rightarrow u' = u-2 \Rightarrow u' = u-3 \Rightarrow u = u'+3 \\ y' = y-2 \Rightarrow y' = y-2 \Rightarrow y = y'+2 \end{cases}$$

$$y = \frac{2u+1}{u-3} \Rightarrow y' + 2 = \frac{2(u'+3)+1}{u'+3-3} \Rightarrow y' + 2 = \frac{2u'+7}{u'} \Rightarrow y' = \frac{2u'+7}{u'} - 2 = \frac{2u'+7-2u'}{u'} = \frac{7}{u'} \text{ که جواب}$$

$$\begin{cases} 3u+2y=2 \\ (u-5y=1)x-2 \end{cases} \Rightarrow \begin{cases} 3u+2y=2 \\ -4u+10y=-2 \end{cases} \Rightarrow \frac{19y}{19} = -1 \Rightarrow y = -\frac{1}{19} \text{ و } u = \frac{12}{19} \Rightarrow \text{جواب}$$

$$u = - \frac{(2)(1) - (2)(-5)}{(3)(-5) - (2)(1)} = \frac{-12}{-19} = \frac{12}{19} \Rightarrow \text{جواب}$$

$$y = \frac{2(1) - (1)(2)}{3(-5) - (2)(1)} = \frac{-1}{19} \Rightarrow \text{جواب}$$

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