

نام و نام خانوادگی پاسخنامه تشریحی تکلیف شماره کلاس نام و نام خانوادگی	
$A \begin{pmatrix} 1 & 2 \end{pmatrix} \rightarrow \text{ان} \begin{pmatrix} 1 & 2 \end{pmatrix} \begin{vmatrix} 1 & 2 \\ 1 & 2 \end{vmatrix} \Rightarrow \frac{\Delta y}{\Delta x} \cdot \Delta x = \frac{1}{-1} \Rightarrow y = -1x + b$ $12 - 14 + b = 0 \Rightarrow b = 2$ ب) $a = a' \Rightarrow 2y + 4x = b \Rightarrow 4 + 2 \cdot 2 = b \Rightarrow b = 8$ ج) $a \cos \alpha = 1 \Rightarrow \cos \alpha = \frac{1}{2} \Rightarrow \alpha = \frac{\pi}{3} \Rightarrow y = \frac{1}{2}x + b \Rightarrow b = -1$ د) $a \cdot \tan \alpha = \tan \frac{\pi}{4} = 1 \Rightarrow y = x + b \Rightarrow b = -1$	(2) 1
$A \begin{pmatrix} 1 & 2 \end{pmatrix} \text{ ان} \begin{pmatrix} 1 & 2 \end{pmatrix} \rightarrow A \cdot \begin{pmatrix} 1 & 2 \end{pmatrix} = \sqrt{1^2 + 2^2} = \sqrt{5}$ $\cos \alpha = \frac{1}{\sqrt{5}} \Rightarrow \alpha = \arccos \left(\frac{1}{\sqrt{5}} \right)$ ب) $\cos \alpha = \frac{ ax + by + c }{\sqrt{a^2 + b^2}}$ $\cos \alpha = \frac{ 1 \cdot 1 + 2 \cdot 2 + c }{\sqrt{1^2 + 2^2}} = \frac{1}{\sqrt{5}} \Rightarrow 5 + c = 1 \Rightarrow c = -4$	(2) 2
$2x + 4y - 12 = 0 \Rightarrow x + 2y - 6 = 0$ $2x + 4y - 12 = 0 \Rightarrow x + 2y - 6 = 0$ ب) $\cos \alpha = \frac{ c - c' }{\sqrt{a^2 + b^2}}$ $\cos \alpha = \frac{ -12 + 12 }{\sqrt{2^2 + 4^2}} = 0 \Rightarrow \alpha = \frac{\pi}{2}$	(2) 3
$\frac{ ax + by + c }{\sqrt{a^2 + b^2}} = \frac{ ax + by + c' }{\sqrt{a'^2 + b'^2}} \Rightarrow \frac{ 2x - 2y - 1 }{\sqrt{2^2 + (-2)^2}} = \frac{ 2x + 2y - 1 }{\sqrt{2^2 + 2^2}}$ $ 2x - 2y - 1 = 2x + 2y - 1 $ $2x - 2y - 1 = 2x + 2y - 1 \Rightarrow -4y = 0 \Rightarrow y = 0$ $2x - 2(0) - 1 = 0 \Rightarrow 2x = 1 \Rightarrow x = \frac{1}{2}$	(2) 4
$\frac{ 2 - (-3) }{ 1 + (-2) } = \frac{ 5 }{ -1 } = 5$ $\tan \alpha = \left \frac{a - a'}{1 + aa'} \right $ $\tan \alpha = \left \frac{2 - (-3)}{1 + 2(-3)} \right = \left \frac{5}{-5} \right = 1 \Rightarrow \alpha = \frac{\pi}{4}$	(2) 5

انت) $AB = \sqrt{x^2 + y^2} = \sqrt{1^2 + (-4)^2} = \sqrt{17} \approx 4.123$ ✓

ب) $M_{AB} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right) = \left(\frac{1 + (-1)}{2}, \frac{2 + (-2)}{2} \right) = (0, 0)$

1.75

6

انت) مرکز جاذب مرکز ثقل است که مختصات آن به صورت زیر است:

ب) $M = \left(\frac{x_1 + x_2 + x_3}{3}, \frac{y_1 + y_2 + y_3}{3} \right) = \left(\frac{1 + 2 + 3}{3}, \frac{1 + 2 + 3}{3} \right) = (2, 2)$

1.5

7

ب) برای محاسبه δ از حاصل ضربین مختصات آن به صورت زیر است:

$$\delta = \frac{1}{2} \begin{vmatrix} x_1 & x_2 & x_3 \\ y_1 & y_2 & y_3 \\ 1 & 1 & 1 \end{vmatrix} = \frac{1}{2} \begin{vmatrix} 1 & 2 & 3 \\ 1 & 2 & 3 \\ 1 & 1 & 1 \end{vmatrix} = \frac{1}{2} \begin{vmatrix} 1 & 2 & 3 \\ 0 & 0 & 0 \\ 0 & 0 & 0 \end{vmatrix} = 0$$

الف) $y_1 = y_2 \Rightarrow f(x) = y_2 \frac{x-1}{x-2} \Rightarrow y = \frac{x+1}{x-2}$

1.75

8

ب) $x_1 = x_2 \Rightarrow y_2 = \frac{x+1}{x-2} \Rightarrow y = \frac{x+1}{x-2}$

الف) $x = x-2 \Rightarrow f(x) = y-2 = \frac{x+1}{x-2} \Rightarrow y = \frac{x+1}{x-2}$

2

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ب) $x = x-2 \Rightarrow f(x) = y-2 = \frac{x+1}{x-2} \Rightarrow y = \frac{x+1}{x-2}$

الف) $3x + 4y = 2$ و $x - 5y = 1$ $\Rightarrow y = -\frac{1}{19}$ و $x = \frac{13}{19}$

2

10

ب) $x = -\frac{1}{19}$ و $y = -\frac{1}{19}$