

الف)  $m = \frac{2-(-2)}{4-5} = -4$   $\Rightarrow y - 2 = -4(x - 4) \Rightarrow -4x + 18 = y$   
 $\Rightarrow 4x - y + 18 = 0$

ب)  $m = \frac{2-(-2)}{4-5} = -4$   $\Rightarrow y - 2 = -4(x - 4) \Rightarrow -4x + 18 = y$   
 $\Rightarrow 4x - y + 18 = 0$

ج) چون خط عمود بر خط شیب که برابر است  $m = -\frac{1}{-4} = \frac{1}{4}$  است  
 $\Rightarrow y - 2 = \frac{1}{4}(x - 4) \Rightarrow x - 4 = 4y - 16 \Rightarrow x - 4y + 12 = 0$

الف)  $\Delta = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} = \sqrt{(4 - (-2))^2 + (2 - (-2))^2} = \sqrt{64 + 16} = \sqrt{80} = 4\sqrt{5}$

الف)  $\Delta = \frac{|4x - y + 18|}{\sqrt{4^2 + (-1)^2}} = \frac{|4(4) - 2 + 18|}{\sqrt{17}} = \frac{|16 - 2 + 18|}{\sqrt{17}} = \frac{32}{\sqrt{17}}$

معادله خط:  $ax + by + c = 0$   $\Rightarrow \frac{ax + by + c}{\sqrt{a^2 + b^2}} = 0$

الف)  $\Delta = \frac{|4x - y + 18|}{\sqrt{4^2 + (-1)^2}} = \frac{|4(4) - 2 + 18|}{\sqrt{17}} = \frac{32}{\sqrt{17}}$

الف)  $\Delta = \frac{|4x - y + 18|}{\sqrt{4^2 + (-1)^2}} = \frac{|4(4) - 2 + 18|}{\sqrt{17}} = \frac{32}{\sqrt{17}}$

$m = -2$   $m' = 2$   $\Rightarrow y - 5 = 2(x - 4) \Rightarrow y = 2x - 3$

الف)  $\Delta = \frac{|m + m'|}{1 + mm'} = \frac{|-2 + 2|}{1 + (-2)(2)} = \frac{0}{1 - 4} = 0$

(الف)  $A|_{-2}^2 \quad B|_{-4}^{-5} \rightarrow \sqrt{(2-(-5))^2 + (-2-(-4))^2} = \sqrt{(8)^2 + (-2)^2} = 10$

6

ب) 
$$\left. \begin{array}{l} \text{طول} \\ \frac{x_1 + x_2}{2} \\ \text{عرض عمود وسط} \\ \frac{y_1 + y_2}{2} \end{array} \right\} A|_{-2}^2 \Rightarrow \left| \begin{array}{c} \frac{2-5}{2} \\ \frac{4-2}{2} \end{array} \right| = \left| \begin{array}{c} -1 \\ 1 \end{array} \right|$$

(الف) 
$$\left. \begin{array}{l} \text{طول مرکز ثقل} \\ \frac{x_1 + x_2 + x_3}{3} \\ \text{عرض مرکز ثقل} \\ \frac{y_1 + y_2 + y_3}{3} \end{array} \right\} A|_{-2}^2 \quad B|_{-4}^{-5} \Rightarrow \left| \begin{array}{c} \frac{-10-2+3}{3} \\ \frac{-14+2+1}{3} \end{array} \right| = \left| \begin{array}{c} -4 \\ -4 \end{array} \right|$$

7

ب) 
$$\left| \begin{array}{ccc} -10 & -14 & 1 \\ -2 & 2 & 1 \\ 2 & 1 & 1 \end{array} \right| = \frac{1}{2} |(-20 - 29 - 2 - (9) - (26) - (-10))| = \frac{96}{2} = 48$$

(الف) نسبت به محور  $x$  عرض مرکزی باشد  
 (ب) نسبت به محور  $y$  طول مرکزی باشد

$$\frac{1}{2} \frac{1}{x-2} = \frac{1}{x+1} \Rightarrow \frac{1}{2} \frac{1}{x-2} = \frac{1}{x+1}$$

8

(ج) بسیار اول و دوم  $x \rightarrow y$   
 $y \rightarrow x$

$$x = \frac{2y+1}{4y-2} \Rightarrow y = \frac{2x+1}{4x-2}$$

(الف) 
$$\left. \begin{array}{l} x' = x-4 \rightarrow x = x'+4 \\ y' = y+2 \rightarrow y = y'-2 \end{array} \right\} y = \frac{2x+1}{4x-2} \Rightarrow y' - 2 = \frac{2(x'+4)+1}{4(x'+4)-2} \Rightarrow \frac{2x'+9}{4x'+14} + 2 = \frac{2x'+4}{x'-1}$$

9

(ب) 
$$\left. \begin{array}{l} x' = x-4 \rightarrow x = x'+4 \\ y' = y+2 \rightarrow y = y'-2 \end{array} \right\} y' = \frac{2(x'+4)+1}{4(x'+4)-2} \Rightarrow \frac{2x'+9}{4x'+14} - 2 = \frac{2x'+4}{x'-1} \Rightarrow \frac{2x'+9}{4x'+14} = \frac{2x'+4}{x'-1} + 2$$

(الف) 
$$\left. \begin{array}{l} 2x + 4y = 2 \\ x - 5y = 1 \end{array} \right\} \Rightarrow \begin{cases} 2x + 4y = 2 \\ -2x + 10y = -2 \end{cases} \Rightarrow 14y = -1 \Rightarrow y = -\frac{1}{14} \Rightarrow x = \frac{14}{14}$$

$$x = \frac{-(4-(-10))}{-15-4} = \frac{14}{19}$$

$$y = \frac{2-2}{-15-4} = \frac{1}{19}$$

10