

①

## STRAIGHT LINE

$$1/a) \quad A(1, 3) \quad B(7, -5)$$

$$x_1 \ y_1 \quad x_2 \ y_2$$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{-5 - 3}{7 - 1}$$

$$= \frac{-8}{6}$$

$$= \underline{\underline{-\frac{4}{3}}}$$

$$b) \quad m = \tan \theta$$

$$\tan \theta = m$$

$$\tan \theta = -\frac{4}{3}$$

$$\theta = \tan^{-1}\left(\frac{4}{3}\right)$$

$$= 53.1^\circ$$

$$\theta = 180 - 53.1^\circ$$

$$= \underline{\underline{126.9^\circ}}$$

$$2/ \quad 3x + 2y - 5 = 0$$

$$2y = -3x + 5$$

$$y = -\frac{3}{2}x + \frac{5}{2}$$

$$y = mx + c$$

$$\therefore m = -\frac{3}{2}$$

parallel lines have same gradient?

$$\therefore m_{\text{parallel}} = -\frac{3}{2}$$

$$\text{pt } \begin{pmatrix} 3 \\ -5 \end{pmatrix}$$

$$\begin{matrix} a \\ b \end{matrix}$$

Eqn

$$y - b = m(x - a)$$

$$y - -5 = -\frac{3}{2}(x - 3) \quad \times 2$$

$$2y + 10 = -3(x - 3)$$

$$2y + 10 = -3x + 9$$

$$\underline{\underline{2y = -3x - 1}}$$

$$R(2, -1) \quad T(8, 3)$$

$$x_1 \ y_1 \quad x_2 \ y_2$$

$$3/ \quad m_{RT} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{3 - -1}{8 - 2}$$

$$= \frac{4}{6}$$

$$= \frac{2}{3}$$

$$m_{\perp} = -\frac{3}{2} \text{ as } m \times m_{\perp} = -1$$

②

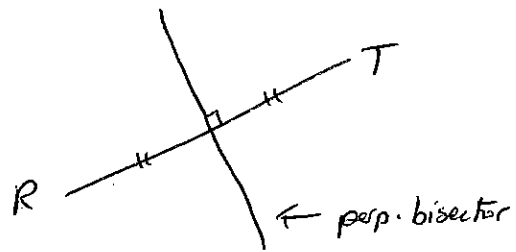
## STRAIGHT LINE

3) cont. Midpt. RT =  $\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$

$$= \left(\frac{2+8}{2}, \frac{-1+3}{2}\right)$$

$$= \left(\frac{10}{2}, \frac{2}{2}\right)$$

$$= (5, 1)$$



$$m = -\frac{3}{2}$$

$$\text{Pt. } (5, 1)$$

Eqn

$$y - b = m(x - a)$$

$$y - 1 = -\frac{3}{2}(x - 5) \quad \times 2$$

$$2y - 2 = -3(x - 5)$$

$$2y - 2 = -3x + 15$$

$$\underline{\underline{2y = -3x + 17}}$$

4) a) P(1, 7)    Q(11, -3)    R(2, -6)

$$x_1 \ y_1 \quad x_2 \ y_2$$

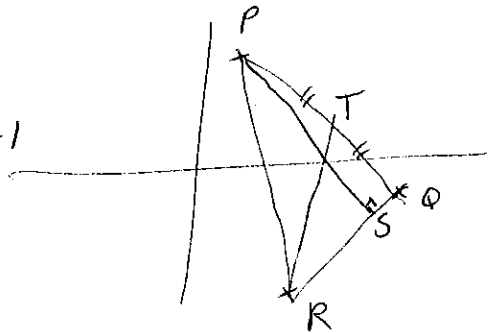
$$m_{QR} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{-6 + 3}{2 - 11}$$

$$= \frac{-3}{-9}$$

$$= \frac{1}{3} \quad \checkmark$$

$$m_{\perp} = -3 \quad \checkmark \text{ as } m \times m_{\perp} = -1$$



$$m = -3$$

$$\text{Pt } P(1, 7)$$

Eqn

$$y - b = m(x - a)$$

$$y - 7 = -3(x - 1)$$

$$y - 7 = -3x + 3$$

$$\underline{\underline{y = -3x + 10}} \quad \checkmark$$

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### STRAIGHT LINE

4, b)  $P(4, 7) \quad Q(11, -3)$   
 $x_1, y_1 \quad x_2, y_2$

$$T = \text{Midpt } PQ = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$$

$$= \left( \frac{4+11}{2}, \frac{7-3}{2} \right)$$

$$= \left( \frac{15}{2}, \frac{4}{2} \right)$$

$$= (7.5, 2) \quad \checkmark$$

$R(2, -6) \quad T(6, 2)$   
 $x_1, y_1 \quad x_2, y_2$

$$m_{RT} = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{2 - (-6)}{6 - 2}$$

$$= \frac{8}{4}$$

$$= 2 \quad \checkmark$$

$m = 2$

Pt.  $R(2, -6)$

Eqn.

$$y - b = m(x - a)$$

$$y + 6 = 2(x - 2)$$

$$y + 6 = 2x - 4$$

$$\underline{\underline{y = 2x - 10}} \quad \checkmark$$

Solve Simultaneously

c) PS  $y = -3x + 10 \rightarrow y + 3x = 10 \quad \times 1 \rightarrow y + 3x = 10$

RT  $\rightarrow y = 2x - 10 \rightarrow y - 2x = -10 \quad \times -1 \rightarrow -y + 2x = 10$

$$+ \quad \underline{\hspace{10em}}$$

$$\hspace{10em} 5x = 20$$

$$\hspace{10em} x = 4$$

$$y = 2x - 10$$

$$y = 2(4) - 10$$

$$= 8 - 10$$

$$= -2$$

Pt. of intersection (4, -2)  $\checkmark$