Co-ordinate Geometry of the line:

Perpendicular lines $m_1 \times m_2 = -1 \Rightarrow m_1 = -\frac{1}{m_2}$

slope or gradient

Parallel lines $m_1 = m_2$ $y = mx + c$ = eqn of line

line $ax + by + c = 0$ $ax + by + k$ is a line parallel

$ax + by + c = 0$ $bx - ay + k$ is a line $\perp$

(swap coefficients & change sign)

To show a $\triangle$ is a right angled $\triangle$

(i) show that one of the slopes of one of the sides x slope of another side $= -1$

OR

(ii) Find the lengths of the sides and show that

$\text{Is}^2 + \text{Is}^2 = \text{Hyp}^2$

The bigger the magnitude of slope, the steeper the line

$\oplus$ means $\nearrow$ (increasing) $\ominus$ means $\searrow$ (decreasing)

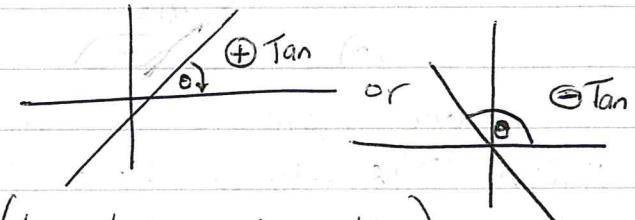
Area of $\triangle$ $\rightarrow$ Bring one side to (0,0) by translation!

Q7 pg 12 ToT4, Q10

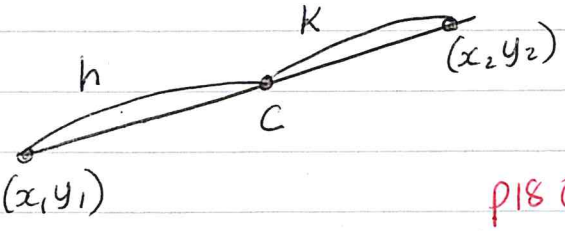
Also rem can use $\frac{1}{2}$(one side) x $\perp$ distance from (side to opp vertex)

slope (m) = Tan of angle θ

pg 16 Q15, Q17, Q20 pg 17



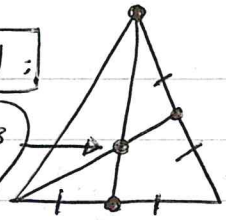
Divide line in given ratio $C = \left(\frac{hx_2 + kx_1}{h+k}, \frac{hy_2 + ky_1}{h+k}\right)$



Read Q carefully !!!

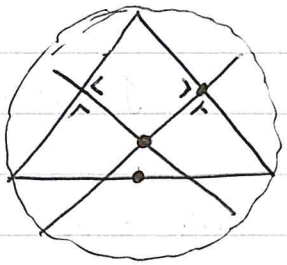
p18 Q3, p18 Q10

Concurrancies of Δ's : **Centroid :** $\left(\frac{x_1+x_2+x_3}{3}, \frac{y_1+y_2+y_3}{3}\right)$

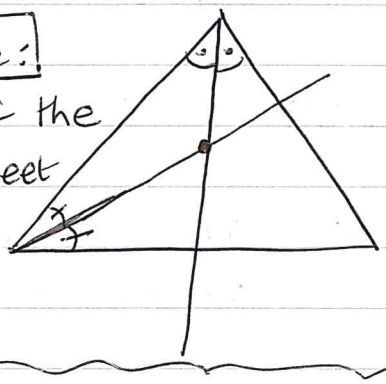


where medians meet (C.O.G)

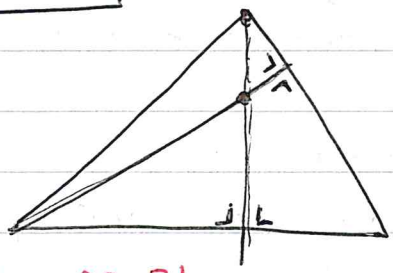
Circumcentre : perpendicular bisectors meet



Incentre : bisectors of the angles meet



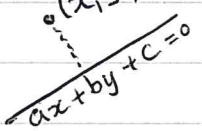
orthocentre :



should be able to do these using coord. geometry and construction

Q5, 6, 7 pg 21

Perpendicular distance from (x, y) to line $ax+by+c=0$



$$= \frac{|ax_1 + by_1 + c|}{\sqrt{a^2+b^2}}$$

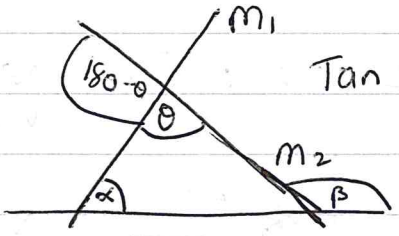
If $ax_1+by_1+c > 0$ point is on one side of line

if $ax_1+by_1+c < 0$ its on the opposite side

Q8 pg 23, Q10, Q17

* useful to find ⊥ height of a △

Angle between 2 lines of slopes m_1, m_2

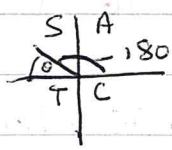


$$\text{Tan}\,\theta = \pm \frac{m_1 - m_2}{1 + m_1 m_2} \quad \underline{\text{OR}} \quad \frac{\text{Tan}\alpha - \text{Tan}\beta}{1 + \text{Tan}\alpha\,\text{Tan}\beta}$$

since $\text{Tan}\,\alpha = m_1$, $\text{Tan}\,\beta = m_2$

∴ one angle is θ, other is $180-\theta$.

* REM $\text{Tan}(180-\theta)$ will have ⊖ sign (θ = acute angle)



Q5 pg 26, Q12 p26