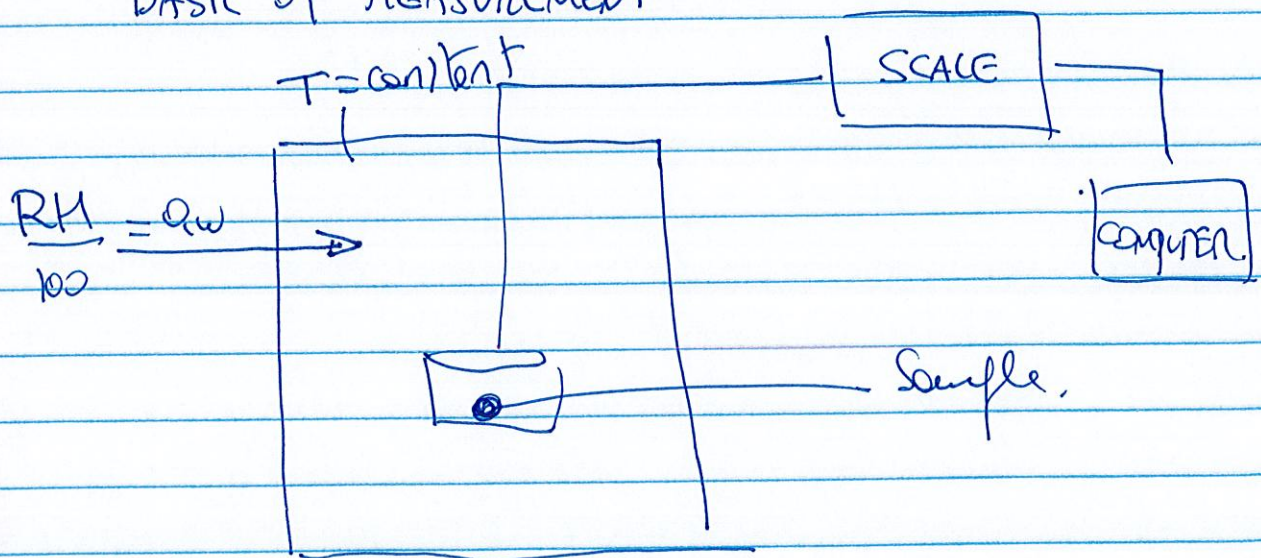


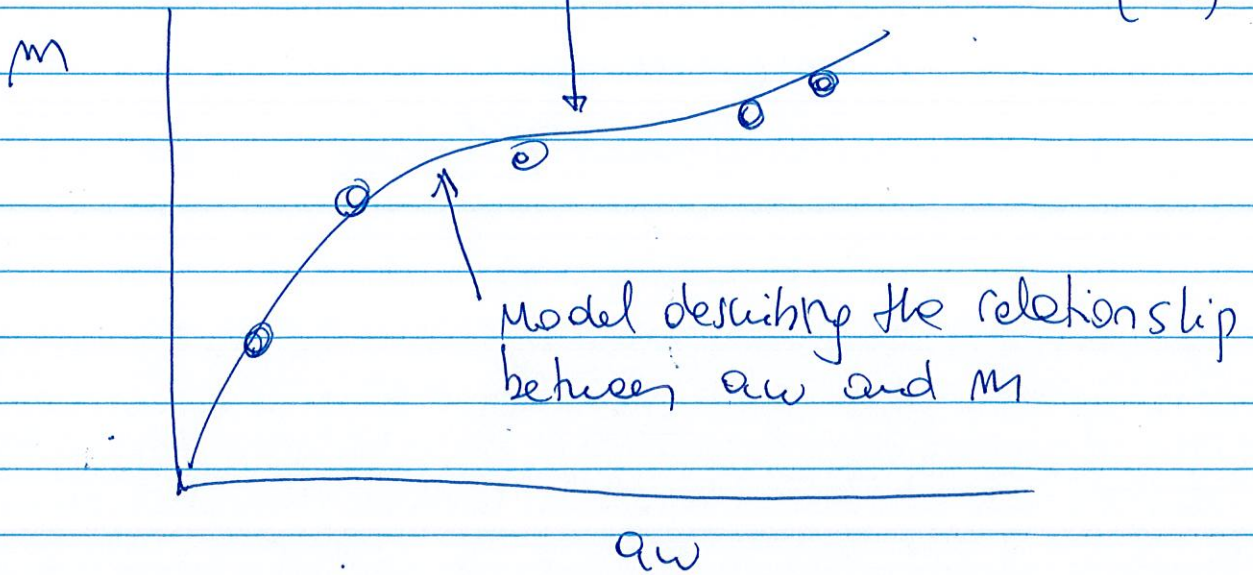
### BASIC OF MEASUREMENT



MODEL

$$m = f(a_w)$$

(2)



1. BET Model. [ $m_0$  and  $C$  are parameters of the model]

ROOT OF AN EQUATION

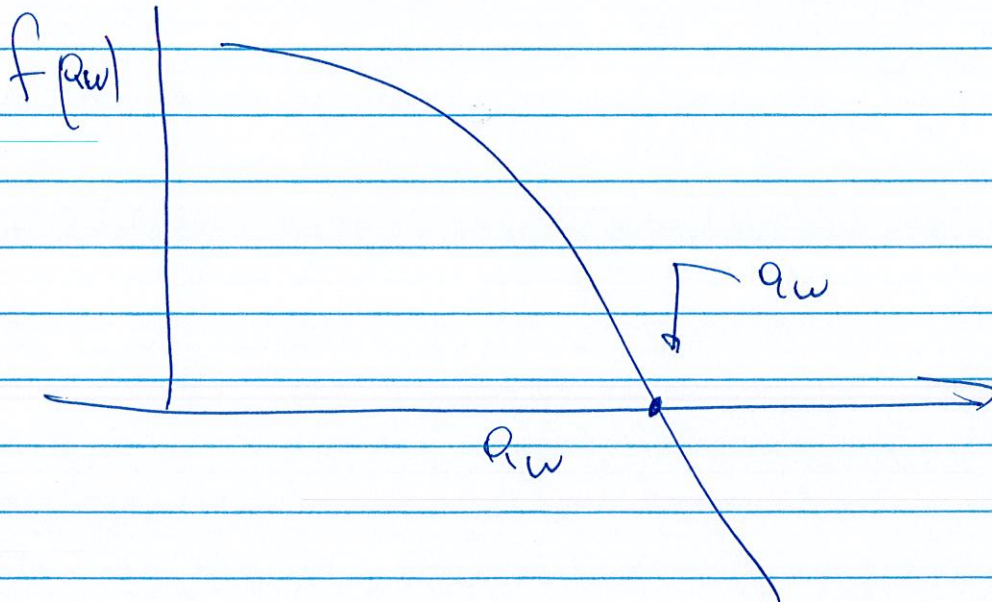
BET

$$f(a_w, m, C, m_0) \rightarrow \underline{\underline{a_w}}$$

↑  
KNOWN

parameters

$$f(a_w, m, C, m_0) = 0$$





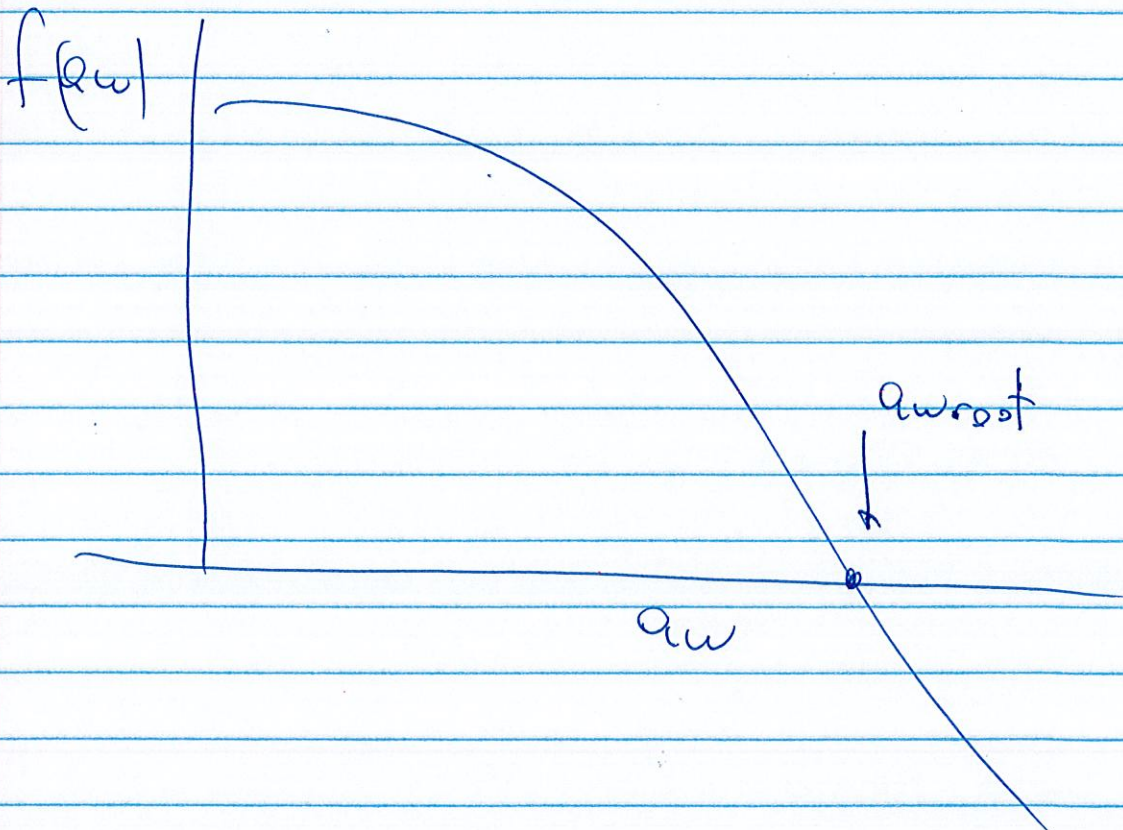
(3)

$$\frac{q_w}{(1-q_w)m} = \frac{1}{M_0 C} + \frac{(C-1)q_w}{M_0 C}$$

$\nearrow$  20%       $\nearrow$  2.91       $\downarrow$  5.9       $\downarrow$

We want to calculate  
 $q_w$

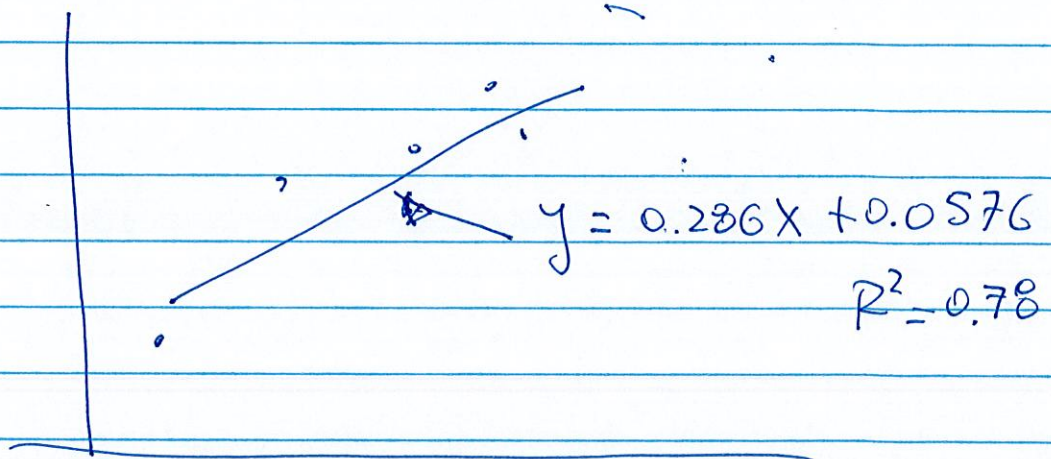
$$f(q_w) = \frac{q_w}{(1-q_w)m} - \frac{1}{M_0 C} - \frac{(C-1)q_w}{M_0 C} = 0$$



how do we get  $m_0$  &  $C$  (parameters) (4)  
of the BET model

$q_w$	$m$		$q_w$	$\frac{q_w}{(1-q_w)m}$
—	—		—	—
—	—		—	—
—	—	→	—	—
—	—		—	—
—	—		—	—

Plot this in excel.





From BET [modified equation]

(5)

$$\underbrace{\frac{Q_w}{(1-Q_w)M}}_y = \underbrace{\frac{1}{M_0 C}}_{\text{Intercept}} + \underbrace{\frac{(C-1)}{M_0 C}}_{\text{slope}} Q_w$$

↓

$$\left\{ \begin{array}{l} \frac{1}{M_0 C} = 0.0576 \\ \frac{C-1}{M_0 C} = 0.286 \end{array} \right. \Rightarrow \begin{array}{l} C = 5.963 \\ M_0 = 3.91 \end{array}$$

2 Equations with 2 unknown

$Q_w$	% moisture $M$
0	0
0.12	6.9
—	—
—	—



to get the root of the equation you (6)  
 can use Math Cad the function root  
 [recommended for future classes] or

you can use Goal Seek in Excel.

↳ see excel Example.

$$f(x) = x^2 - 6x + 8 = 0$$

↳ root of the equation

$$\frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

$$\frac{6 + \sqrt{36 - 32}}{2} = 4$$

$$\frac{6 - \sqrt{36 - 32}}{2} = 2$$

Using Solver-

x	y <sub>exp</sub>	y <sub>model</sub>		(y <sub>exp</sub> - y <sub>model</sub> ) <sup>2</sup>
Qw	m	-		
		-		
		-		
		-		
		-		
			SUM	0

$K =$   
 $C =$   
 $m_0 =$