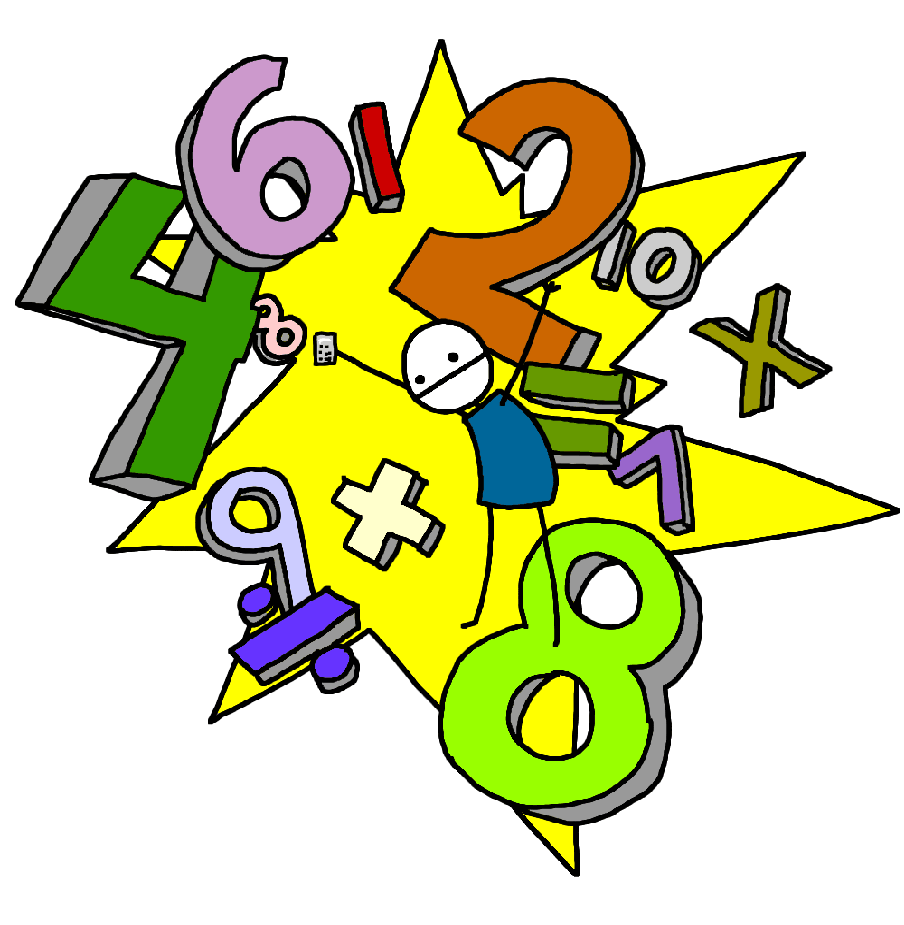
**Trigonometry**

**name: Ameena Fadhl – Latifa Almulla**

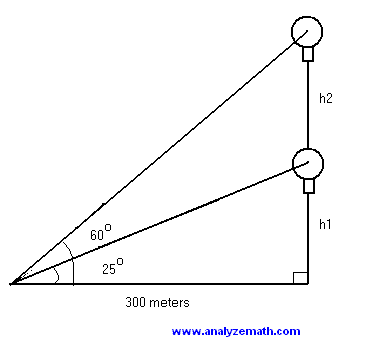
**class: 12-3**

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**Dedicate :**

Dear Ms.tahani the parameter that has made every effort to make us love math word .. I did not see a teacher like you in my life A wonderful sense of the word .. Thank you for every moment of the sacrifice for us .. Thank you very much and best regards to you with my wishes you success in life, practical and scientific , love you .

**Problem 1 :**

The angle of elevation of a hot air balloon, climbing vertically, changes from 25 degrees at 10:00 am to 60 degrees at 10:02 am. The point of observation of the angle of elevation is situated 300 meters away from the takeoff point. What is the upward speed, assumed constant, of the balloon? Give the answer in meters per second and round to two decimal places.

**Solution to Problem 1:**

Step(1)

* Use the tangent to write   
   **tan(25o) = h1 / 300   
  and   
  tan(60o) = (h1 + h2) / 300**

Step(2)

* Solve for h1 and h2   
    
  **h1 = 300 tan(tan(25o))   
  and   
  h1 + h2 = 300 tan(60o)**

Step(3)

* Use the last two equations to find h2   
    
  **h2 = 300 [ tan(60o) - tan(25o) ]**

Step(4)

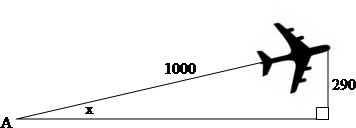
* If it takes the balloon 2 minutes

(10:00 to 10:02) to climb h2, the the

upward speed S is given by   
  
**S = h2 / 2 minutes   
  
= 300 [ tan(60o) - tan(25o) ] / (2 \* 60) = 3.16 m/sec**

**Problem 2:**

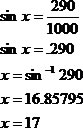
A plane takes off from a runway at point A and climbs while maintaining a constant angle with the ground, as shown in the accompanying diagram. When the plane has traveled 1000 meters, its altitude is 290 meters. Find, to the nearest degree, the angle, x, at which the plane has climbed with respect to the ground.



Since we are looking for the angle marked x and

we have the opposite side (290) and the hypotenuse (1000),

we are going to use the sine function.



**So the airplane has made a 17 degree angle with the ground.**

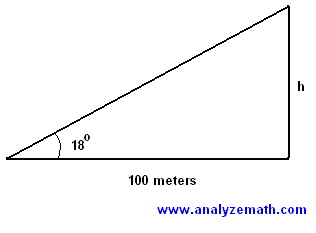
**Problem 3:**

A person 100 meters from the base of a tree, observes that the angle between the ground and the top of the tree is 18 degrees. Estimate the height h of the tree to the nearest tenth of a meter.

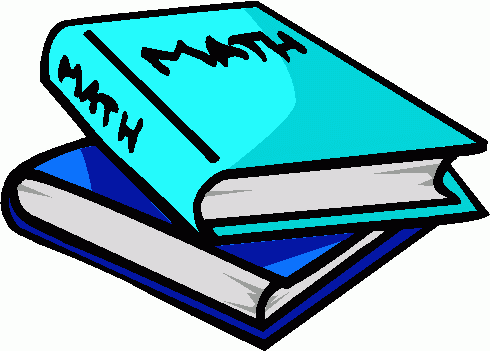


**Solution to Problem 3:**

* Use the tangent   
   **tan(18o) = h / 100**
* Solve for h to obtain   
    
  **h = 100 tan(18o) = 32.5 meters**



Finally, There are an enormous number of uses of trigonometry and trigonometric functions. For instance, the technique of triangulation is used in astronomy to measure the distance to nearby stars, in geography to measure distances between landmarks, and in satellite navigation systems So is the trigonometry of the most important science, which must be studied as it is very interesting



**Reference :**

<http://mrsgsmathclass.com/Similar%20Triangles%20and%20Trig%20Pages/Solving%20Problems%20Using%20Trigonometry.html>

<http://www.analyzemath.com/Trigonometry_problems/trigonometry_problems.html>