THE story of MATHS OF THE TURNING TRAIN

Turning a runningSTEAM ENGINE train is difficult.

more so because it has no gear box.

piston is directly attached to turning wheels.Indian railways has used maths in three locations to turn the trains

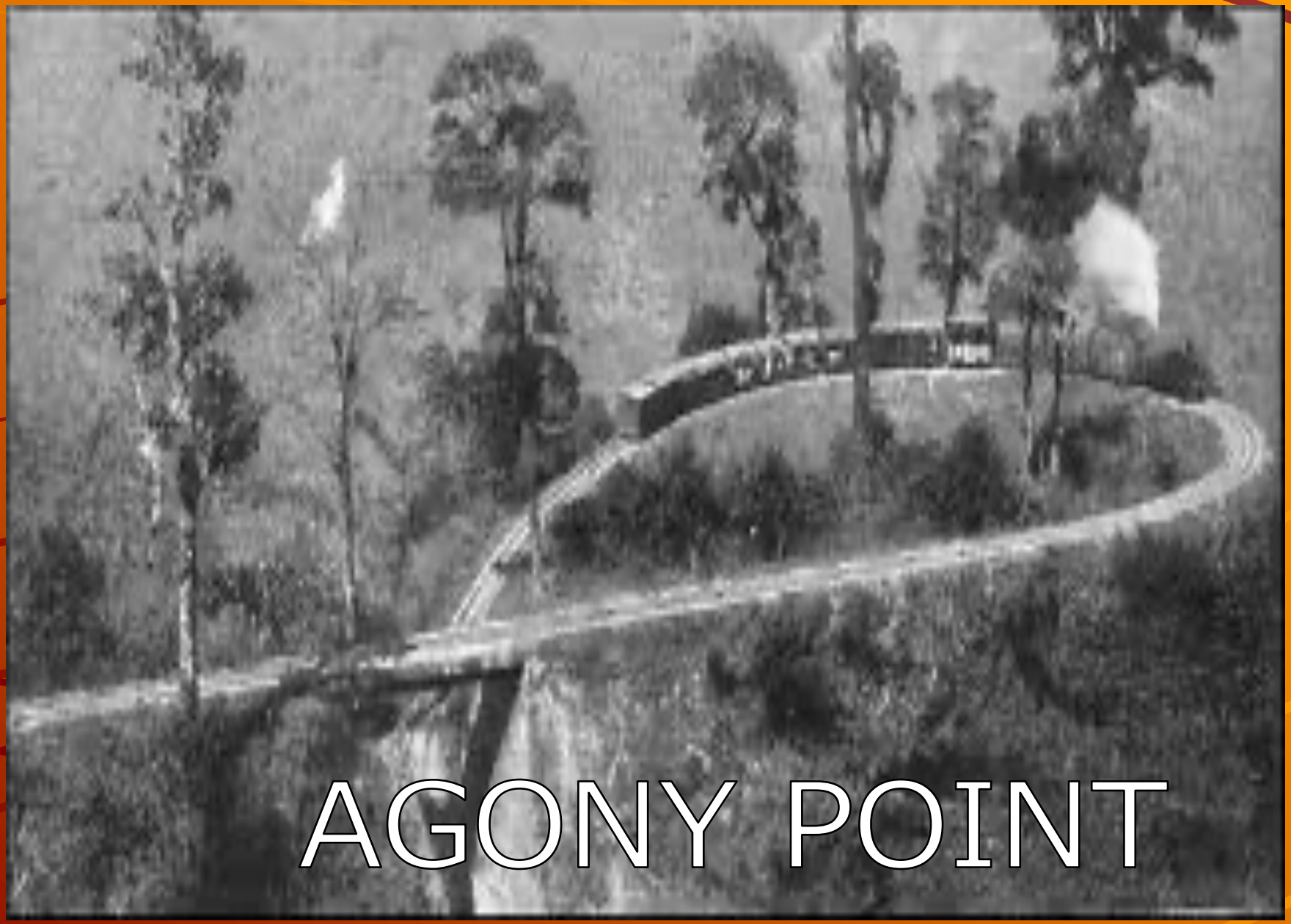
DARJEELING TRAIN

This is Darjeeling toy train

- This is running between darjeeling and siliguri .Train has to go up 3000ft and the journey is not smooth. Train goes up and down and makes lots of turns and twists.
- Added to this is the misty weather which changes at the wink of an eye

The mist makes journey tedius for the driver

- There is a special place called **agony point**


AGONY POINT

As you see the train is coursing a long and big circle

- In fact it is crossing the same point twice
- And this at 5ml/hr speed
- That's why it is agony point

- All this to make the train turn 90*

At Bangalore station the problem was different

- The train arrives from Mysore
- It has to go back again to Mysore
- But there is no space to make a big circular path
- So they would drag the engine on a circular platform
- And then turn the platform half a round
- The engine turns towards Mysore
- Attach this engine to the train and chalo Mysore

TURN TABLE

The platform at Nuremberg can accomadate more Trains

To turn the train 180*

- **Railways have used a turn table**

A RURAL STATION

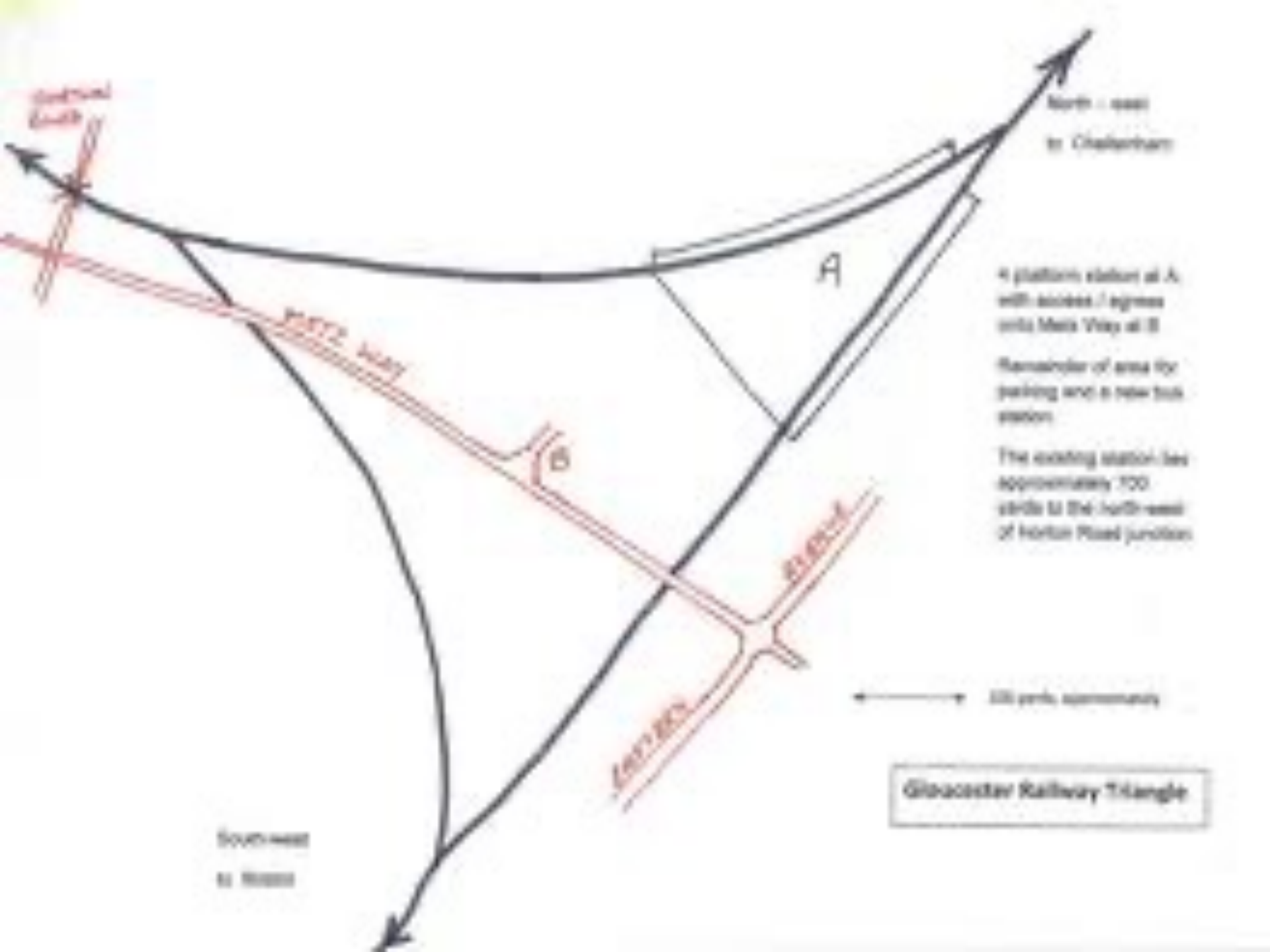
At this station in kolar train is coming from bangarpet

To Bangarpet station it has to go back

There is no space to provide a loop path to turn the train

Nor there is a platform to make a turn

So the Railways used a geometrical theorem of a triangle


A
B
Gloucester Railway Triangle

The external angles of a triangle add up to 360*

- Every one knows that internal angles of a triangle addup to 180*
- In the path laidout at Kolar the train coming from Bangarpet goes from point to point crossing the vertices of a Triangle
- So that it covers all the external angles
- Thereby turning its face to Ba**ngarpet again**

Three different stations

- Three different problems to turn the train
- Three different solutions
- All based on middle school level mthematics
- And a forgotton theorem on triangle