SUBJECT 1 : ROTATION

At dawn, you see the sun rising and all the daylong it is moving across the sky until it falls at dusk.

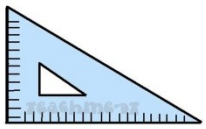
Fig.1 : The sun's path in the sky

Likewise, you can see the stars moving during the night. Are the Sun and the Sky turning **about** the Earth or is it the contrary?

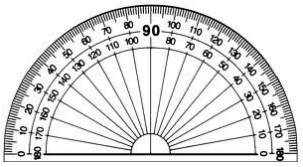
In reality, the direction of a movement only depends on your point of reference. Hence, both assumptions are correct, but it's much simpler to consider that the Earth is turning around its own axis…

Geometry tools:

a compass



a setsquare



a protractor

Task 1 : time-lapse of a photograph

The lens of the camera that took the photograph (Fig.2) has been kept opened for a given duration.

Meanwhile, the Earth turned around its own axis and it seems that each star has left a lightened trail on the picture.

As the photograph was taken in the Northern hemisphere, the **fixed point** is the Pole Star, in prolongation of the Earth's axis.

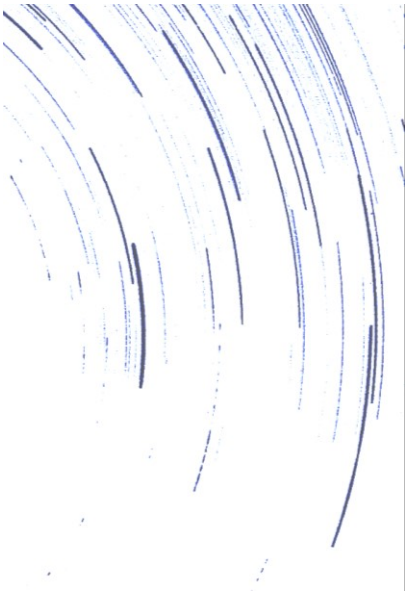
In order to avoid dark pictures, you're given its negative: the dark sky appears white and the lightened trails are black.

Fig.2 : Time-lapse

Find the time lapse of this photo. Explain your method.

Task 2 : time-lapse of a photograph (2)

This time, the photograph was taken from Reunion Island: no star corresponds with the prolongation of the Earth's axis! The time-lapse was 1 hour and 20 minutes.



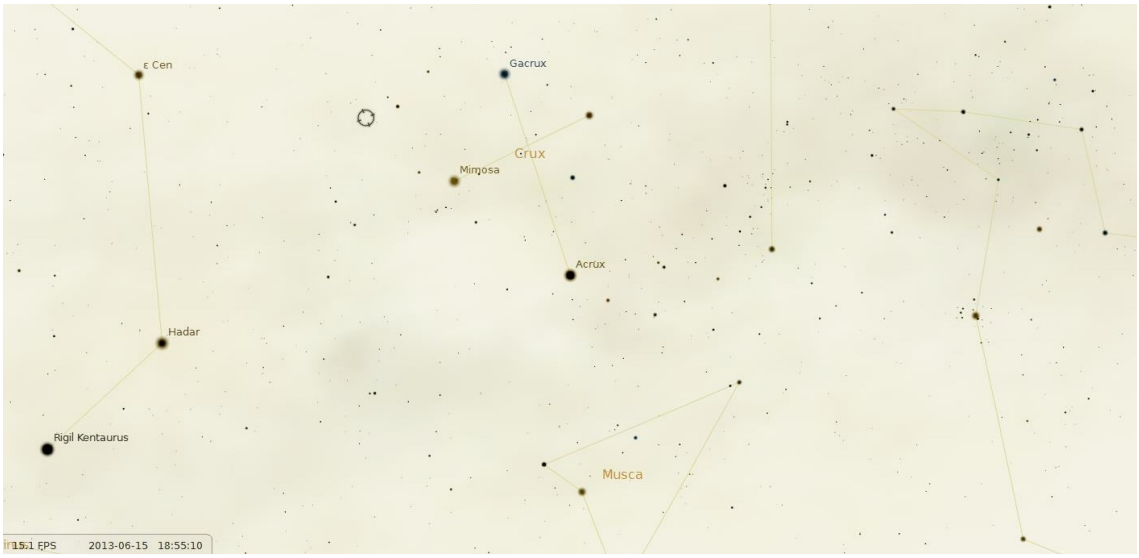
Find the celestial South pole.

Task 3: Celestial South Pole (homework 💻)

Find three methods to determine the position of the celestial South Pole as you're watching the sky.

Task 4: Apparent rotation of the sky

You can see the stars turning about the celestial Pole all the nightlong. The Earth makes one rotation around its axis in a day. Fig. 3 gives a drawing of the position of Crux on 2013 June 15 at 6:55 pm. **Draw it 3 hours later.**



Task 5 : Sky rotation (2)

Below on fig. 4, the position of the star denoted A was A_1 at 8 pm and A_2 at 10 pm. **Find the Pole**.