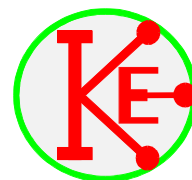


The Inclinator



This instrument enables the height of tall objects to be measured even if the base of the object is not accessible.

Construction

- 1). Carefully mark the angles on the Inclinator every 10° from the centre 0° mark.
- 2). Cut out the Inclinator and stick thick cardboard beneath the white section to give it strength.
- 3). Cut around the Inclinator and card when the glue is dry.
- 4). Fold the greyed part of the Inclinator over the card and glue to form a straight edge.
- 5). Carefully cut a small slit in the straight edge to meet the centre point of the protractor drawing.
- 6). Attach a weight (e.g. a metal nut) to a short piece of cotton and then fix it to the Inclinator so that it passes through the centre point of the protractor.

Using the Inclinator.

The Inclinator is used to measure the angle of elevation to the top of the tall object.

- 1). Hold the Inclinator up to your eye and look along the straight edge to the top of the tall object. The weighted cotton will hang vertically down.
- 2). When the top of the tall object is aligned, tilt the inclinometer so that the cotton presses against the protractor part of the Inclinator. This will fix the angle.
- 3). Read off the angle of Inclination.

Height Calculations

- 1). Measure the height of your eyes above the ground, (h). $h = \dots\dots\dots\text{m}$
- 2). Measure the length of your pace, (P). $P = \dots\dots\dots\text{m}$

When the base of tall object is accessible.

- 1). Go to the base of the tall object, and walk away from it until you can clearly see the top.
Count the number of paces (N) as you walk. $N = \dots\dots\dots$
- 2). From this position, measure the angle of inclination, (θ), to the top of the tall object. $\theta = \dots\dots\dots^\circ$
- 3). The height of the tall object = $h + (N \times P) \times \tan \theta$ metres.

When the base of tall object is not accessible.

- 1). Stand as near to the object as you can (safely!) while still being able to see the top of the tall object.
- 2). Measure the angle of inclination, (θ) to the top. $\theta = \dots\dots\dots^\circ$
- 3). Walk away from the object to a distance where the angle of inclination is different to the first measurement.
Count the number of paces (N) as you walk. $N = \dots\dots\dots$
- 4). Measure this new angle of inclination (ϕ). $\phi = \dots\dots\dots^\circ$
- 5). The height of the tall object = $h + \frac{(N \times P) \times \tan \theta \times \tan \phi}{\tan \theta - \tan \phi}$ metres.

