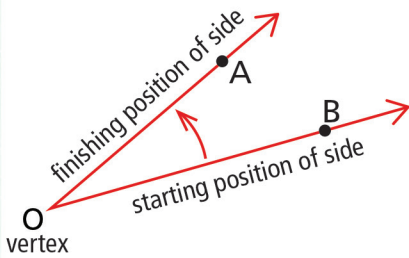


# How to draw an angle with a 360° protractor

## Use with Mathomat V7

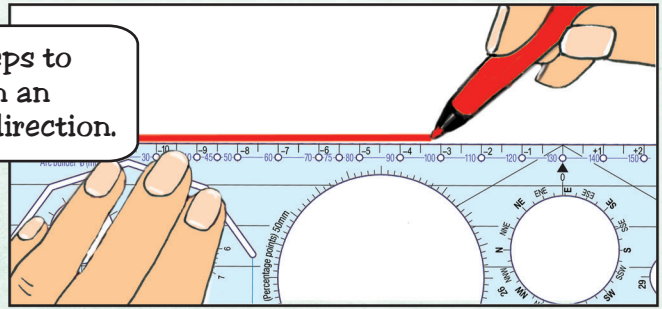
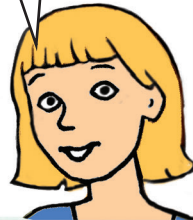
### Anti-clockwise



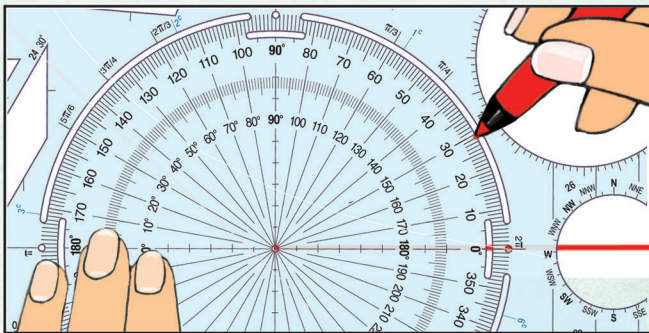
vertex

An angle has two sides, a vertex and an amount of opening.

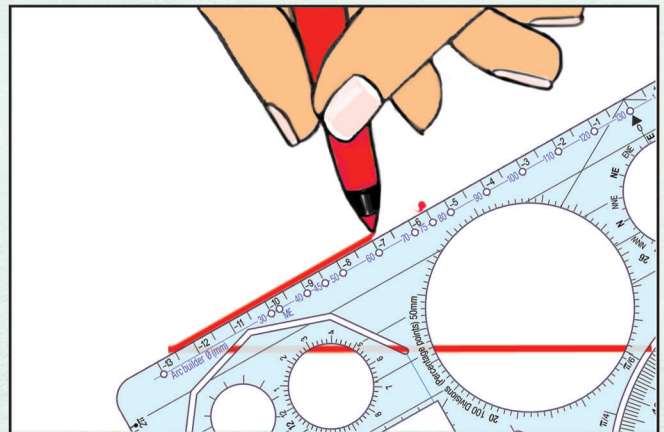
Follow these steps to draw an angle in an anti-clockwise direction.



**Step 1:** Use Mathomat to draw the side of the angle in its starting position. Mark the angle vertex on the left side of this line.

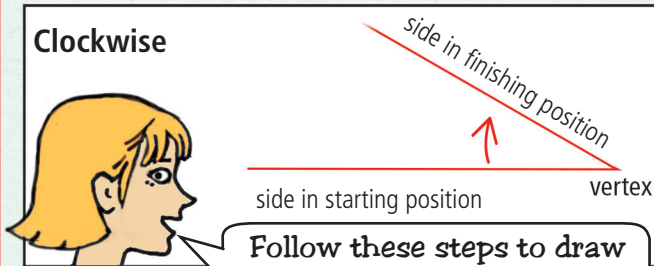


**Step 2:** Position the Mathomat protractor over the angle side, with the central hole of the protractor over the angle vertex and its right-hand baseline above the drawn angle side. Using the outer degree scale mark the page at the desired angle size (30° in this example).

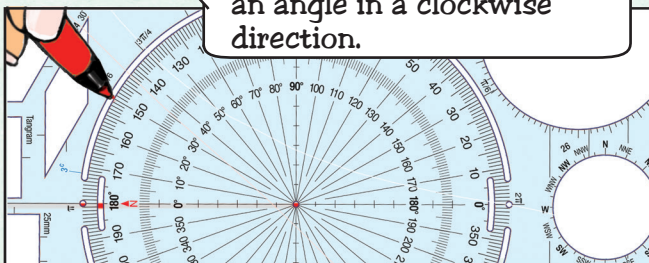


**Step 3:** Draw the second arm of the angle in its finishing position by drawing a line between the position marked in step 2 and the angle vertex.

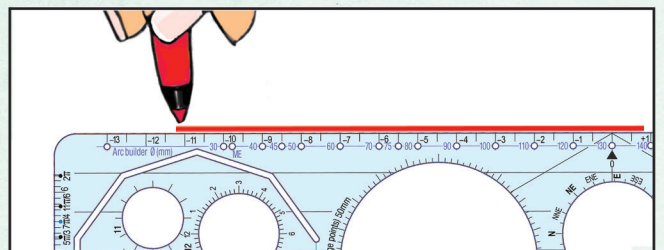
### Clockwise



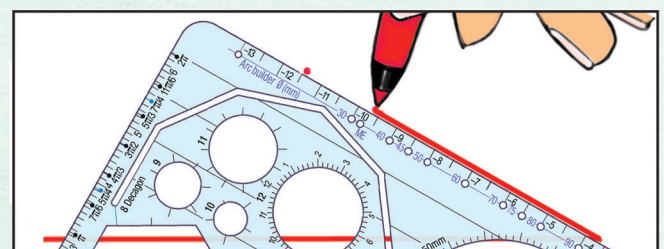
Follow these steps to draw an angle in a clockwise direction.



**Step 2:** Position left hand side of the protractor base line directly over the starting angle side, with the central protractor hole above the angle vertex. Mark the position for the angle side in its finishing position against the inner degree scale of the protractor.



**Step 1:** Draw the side of the angle in its starting position using Mathomat. Mark the vertex on the right-hand end of this line.



**Step 3:** Using Mathomat, draw the side of the angle in its finished position by connecting the point marked in the previous step with the angle vertex.

# Skills sharpener activity 3: drawing angles

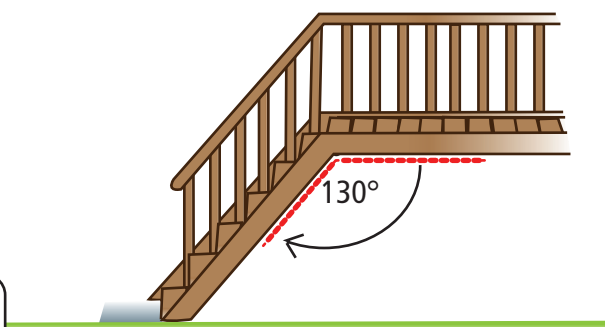
Tina is discussing her house renovation plans with the builder.



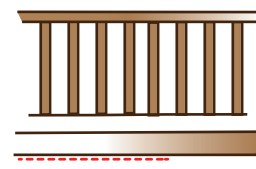
I would like to make those stairs easier to climb.

OK, let's redraw them so they have a 30-degree pitch, and meet the landing at 150° instead of 130°.

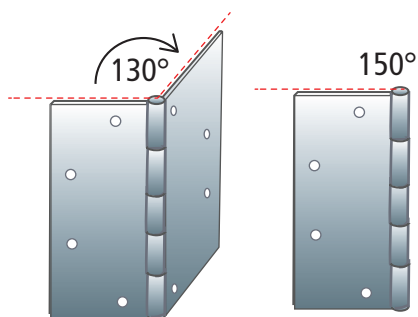
## 1. Steep stairs



Redraw the stairs in the space below so they meet the landing at a 150° angle (at a 30° pitch).



## 2. Open the hinge

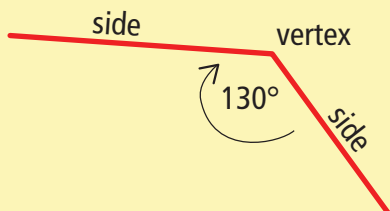


Redraw the angle on this hinge so it is open at 150° instead of 130°.

In both of the situations above, the angles involved had three things in common, they had:

- two sides (base of stairs and landing, top of hinge)
- a vertex (hinge joint, join of staircase with landing)
- an amount of opening between the two sides (either 130° or 150°)

The two 130° angles, for the hinge and the stairs, can be represented in the drawing below.



Use your Mathomat to draw the 150° angle that was in the reset hinge and redesigned staircase in the space below. Mark the sides, vertex and amount of turning in your drawing.

We can represent every angle situation we come across using exactly the same type of drawing because there will always be two sides, a vertex and an amount of opening between the sides in any angle situation.