



# Angles, Polygons and Geometrical Proof

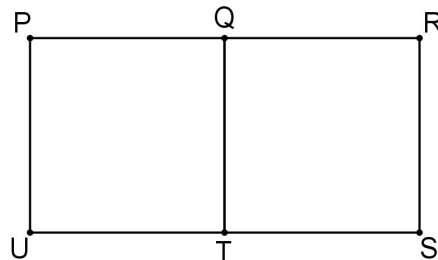
## Stage 3 ★

### Mixed Selection 1

#### 1. Right-angled request

The figure shows a rectangle  $PRSU$  with a line  $QT$  which divides the rectangle into two squares.

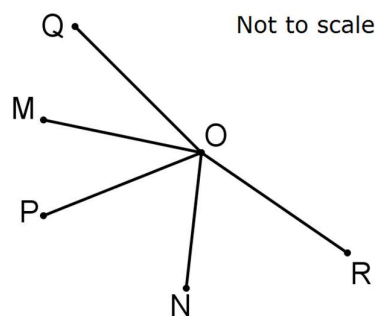
How many right-angled triangles can be drawn using any three points  $P, Q, R, S, T, U$  as corners?



#### 2. Angular reflection

In the diagram,  $\angle MON = 130^\circ$ . The reflection of  $OP$  in  $OM$  is  $OQ$  and the reflection of  $OP$  in  $ON$  is  $OR$ .

What is the size of  $\angle QOR$ ?



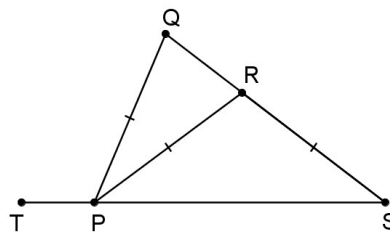
#### 3. Homely angles

A square is labelled anticlockwise  $ABCD$ . The point  $E$  is outside the square so that  $CDE$  is an equilateral triangle. Find angle  $BED$ .

#### 4. Isosceles Meld

In the diagram  $R$  is on the line  $QS$ ,  $P$  is on the line  $TS$ , and  $PQ = PR = RS$ .

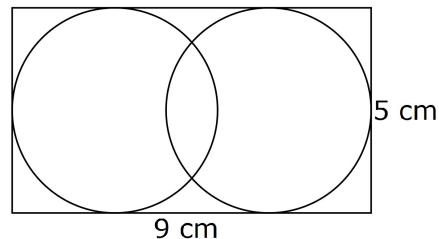
If angle  $QPR$  is 36 degrees, find the size of angle  $QPT$ ?



#### 5. Central distance

The diagram shows two circles enclosed in a rectangle measuring 9cm by 5cm.

What is the distance between the centres of the circles?



*These problems are adapted from UKMT Mathematical Challenge problems ([ukmt.org.uk](http://ukmt.org.uk))*