



# Angles, Polygons and Geometrical Proof

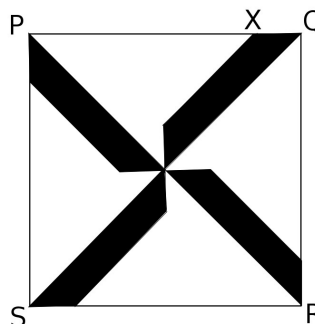
## Stage 4 ★★

### Mixed Selection 1

#### 1. Quarters

Four congruent isosceles trapeziums are placed so that their longer parallel sides form the diagonals of a square PQRS, as shown. The point X divides PQ in the ratio 3:1.

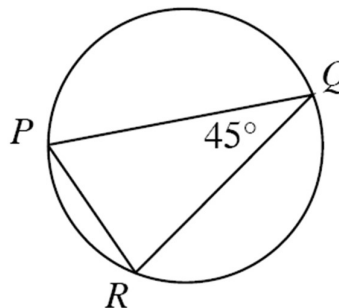
What fraction of the square is shaded?



#### 2. Angle to chord

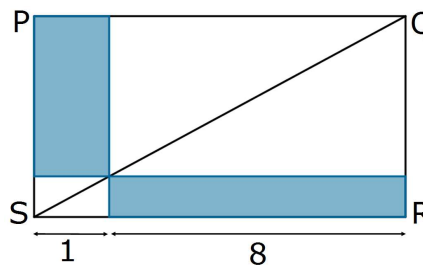
$P$ ,  $Q$  and  $R$  are points on the circumference of a circle of radius 4cm.  $\angle PQR = 45^\circ$ .

What is the length of chord  $PR$ ?



#### 3. Diagonal touch

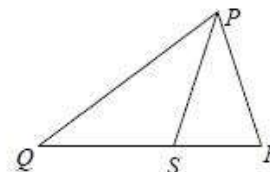
What fraction of rectangle PQRS is shaded?



#### 4. Isosceles reduction

$PQR$  is a triangle and  $S$  is a point on  $QR$ .  
 $QP = QR = 9\text{cm}$  and  $PR = PS = 6\text{cm}$ .

What is the length of  $SR$ ?



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