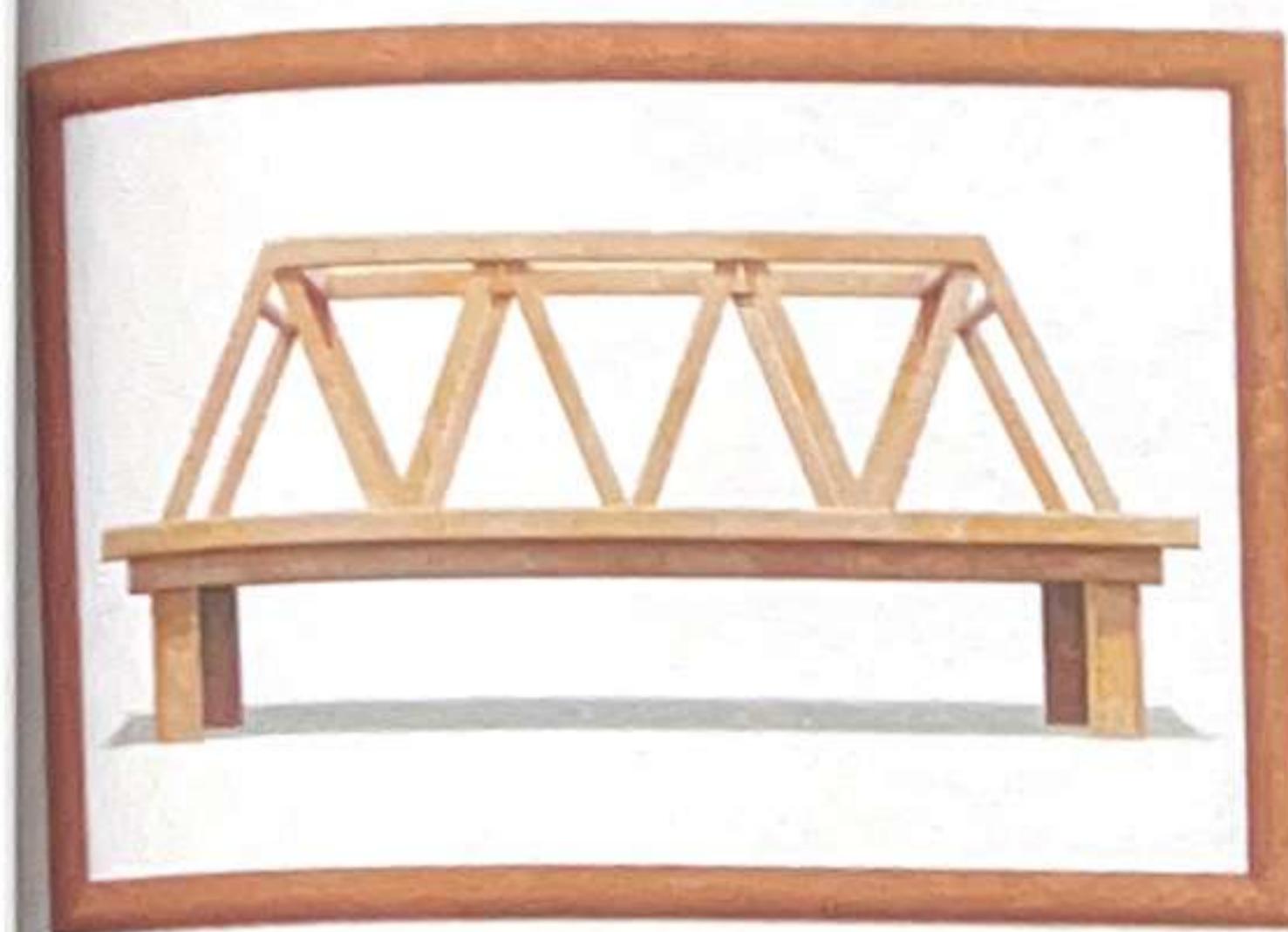


# Angles in Geometrical Figures



I can see some 4-sided figures in the design of the bridge.

What shape can you see in the design of this building?

I can see a trapezium in the design of this house.

Can you identify the different types of angles from the various structures?

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Do you know how to find unknown angles in geometrical figures?

Learn more at  
[go.gov.sg/pm608](http://go.gov.sg/pm608)

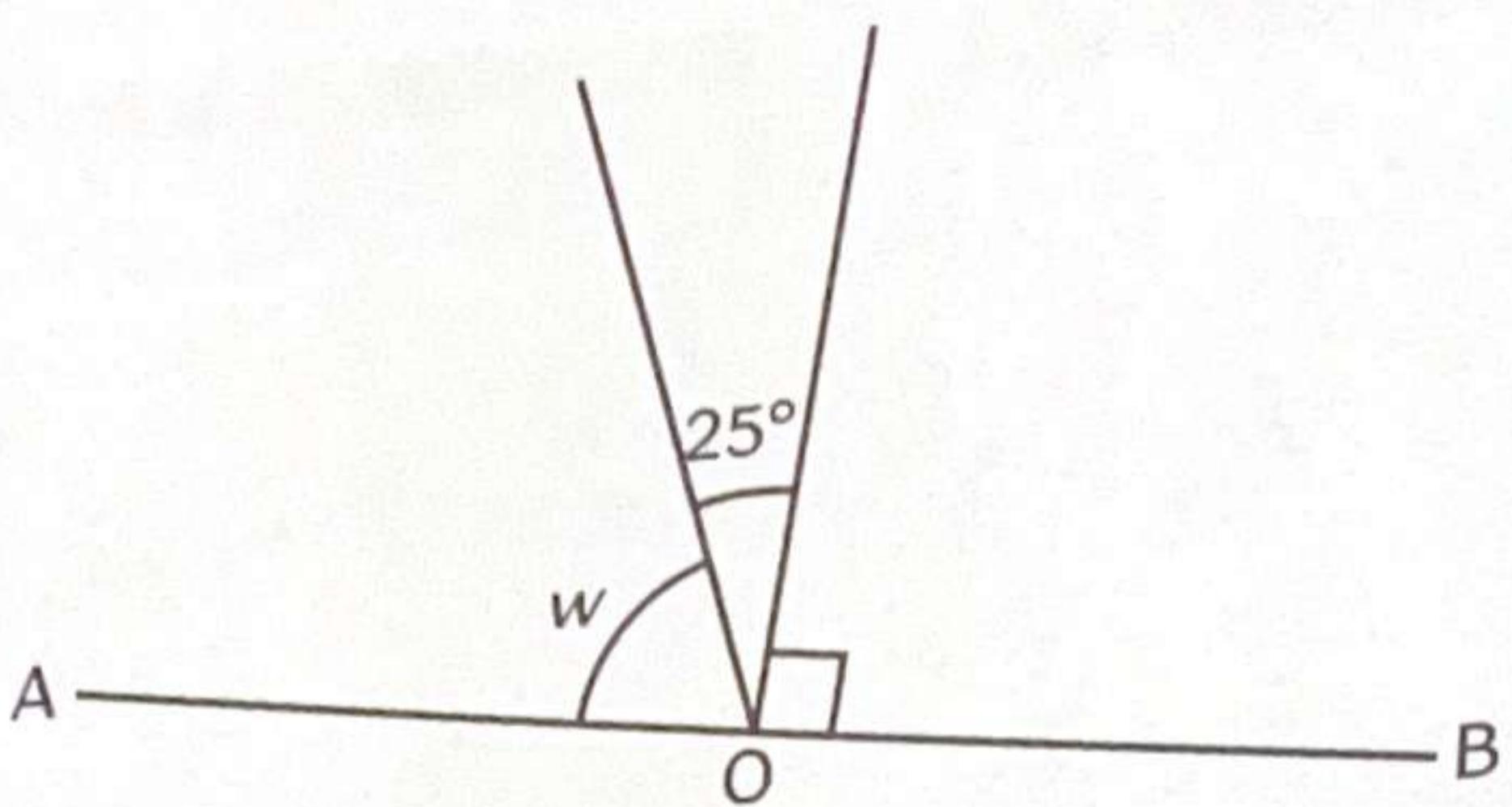


# Finding Unknown Angles



## Recall

- 1 AB is a straight line. Find  $\angle w$ .



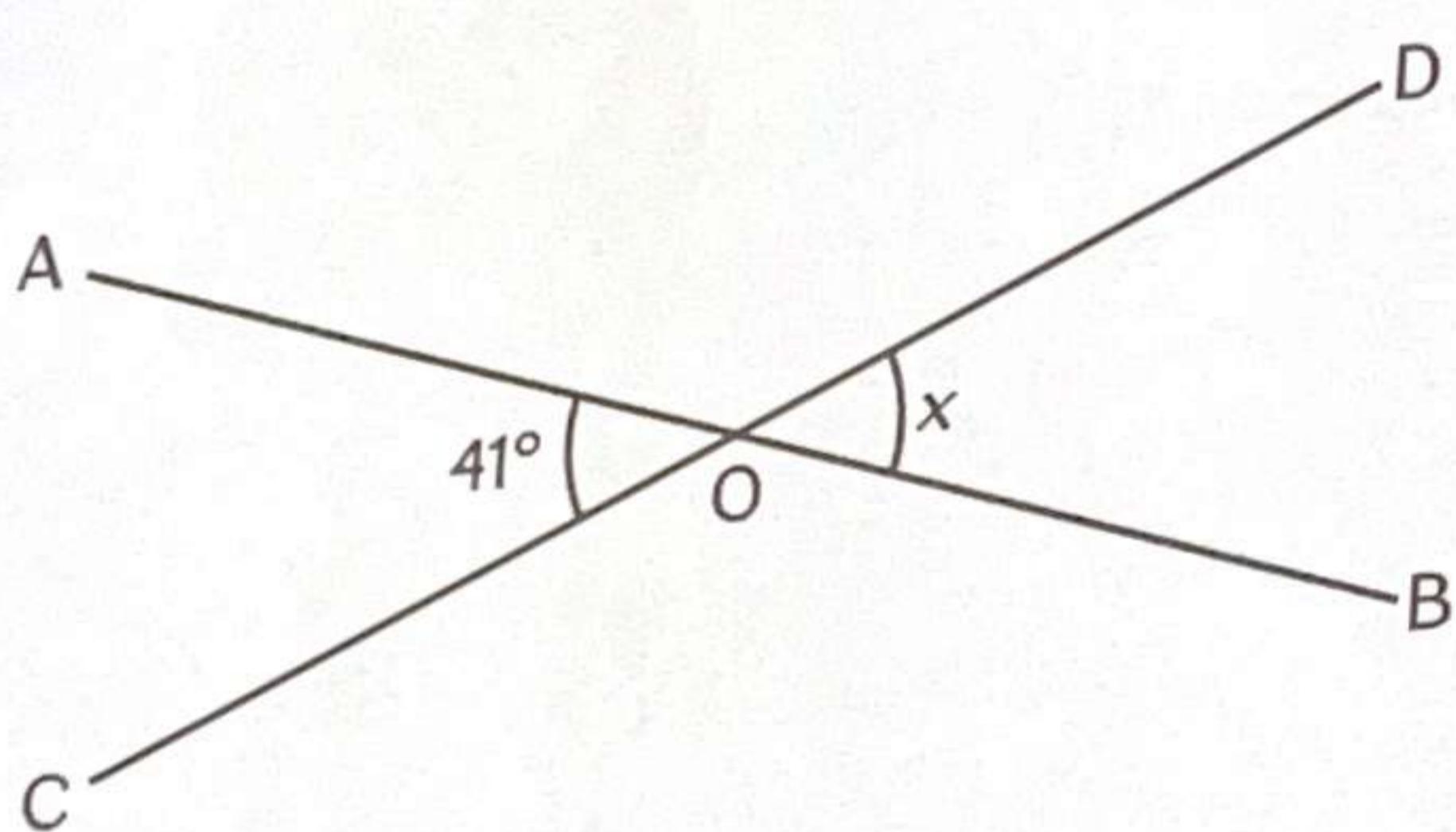
$$\angle w = \boxed{\quad}$$

The sum of angles on a straight line is  $180^\circ$ .

$$\angle a + \angle b + \angle c = 180^\circ$$

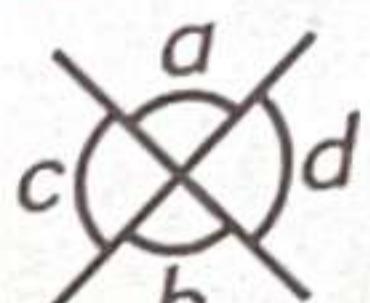


- 2 AB and CD are straight lines. Find  $\angle x$ .



$$\angle x = \boxed{\quad}$$

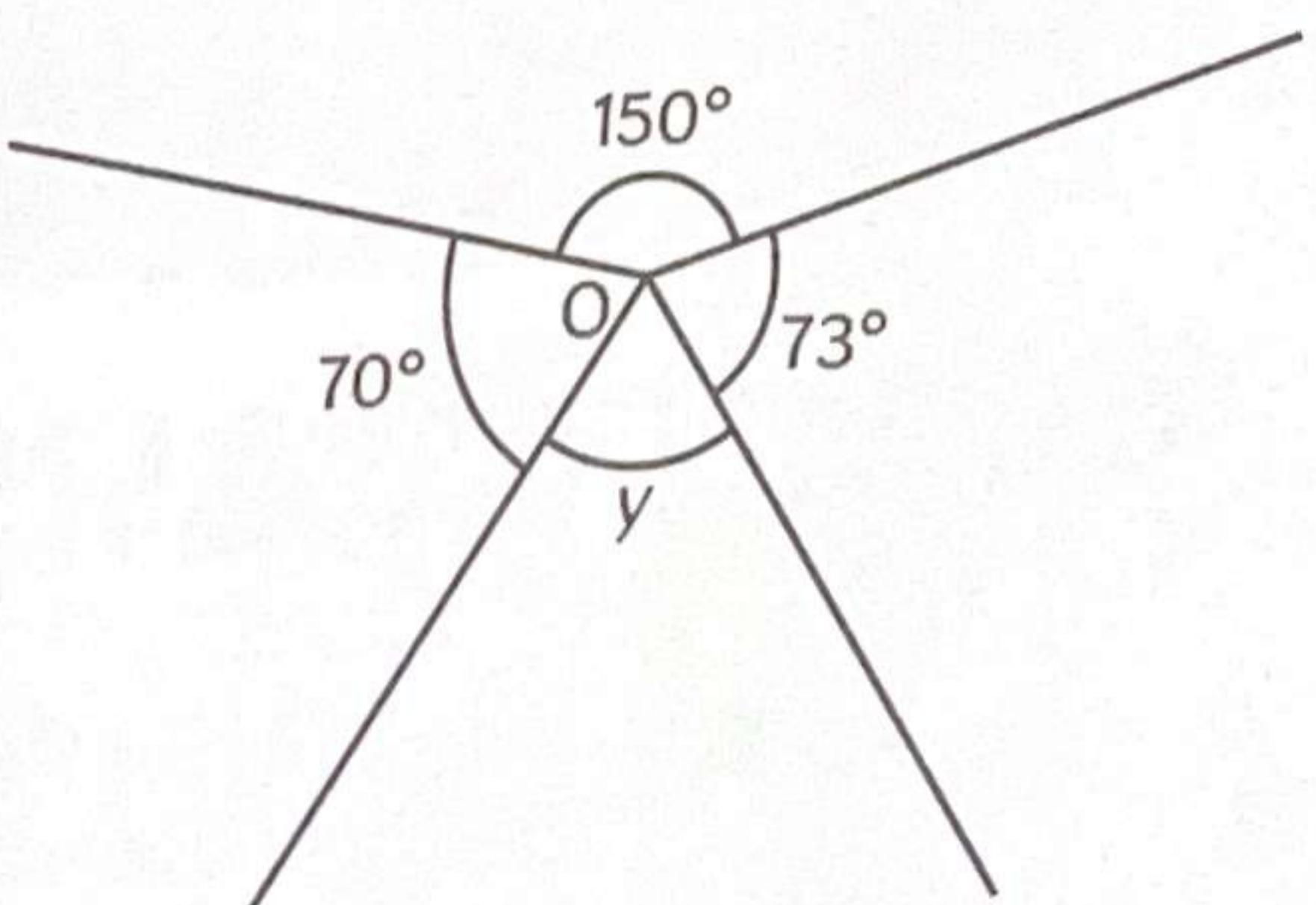
Vertically opposite angles are equal.



$$\angle a = \angle b$$
$$\angle c = \angle d$$

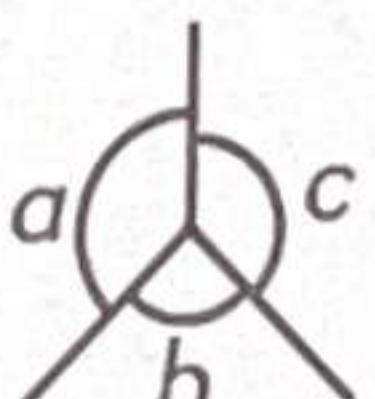


- 3 Find  $\angle y$ .



$$\angle y = \boxed{\quad}$$

The sum of angles at a point is  $360^\circ$ .



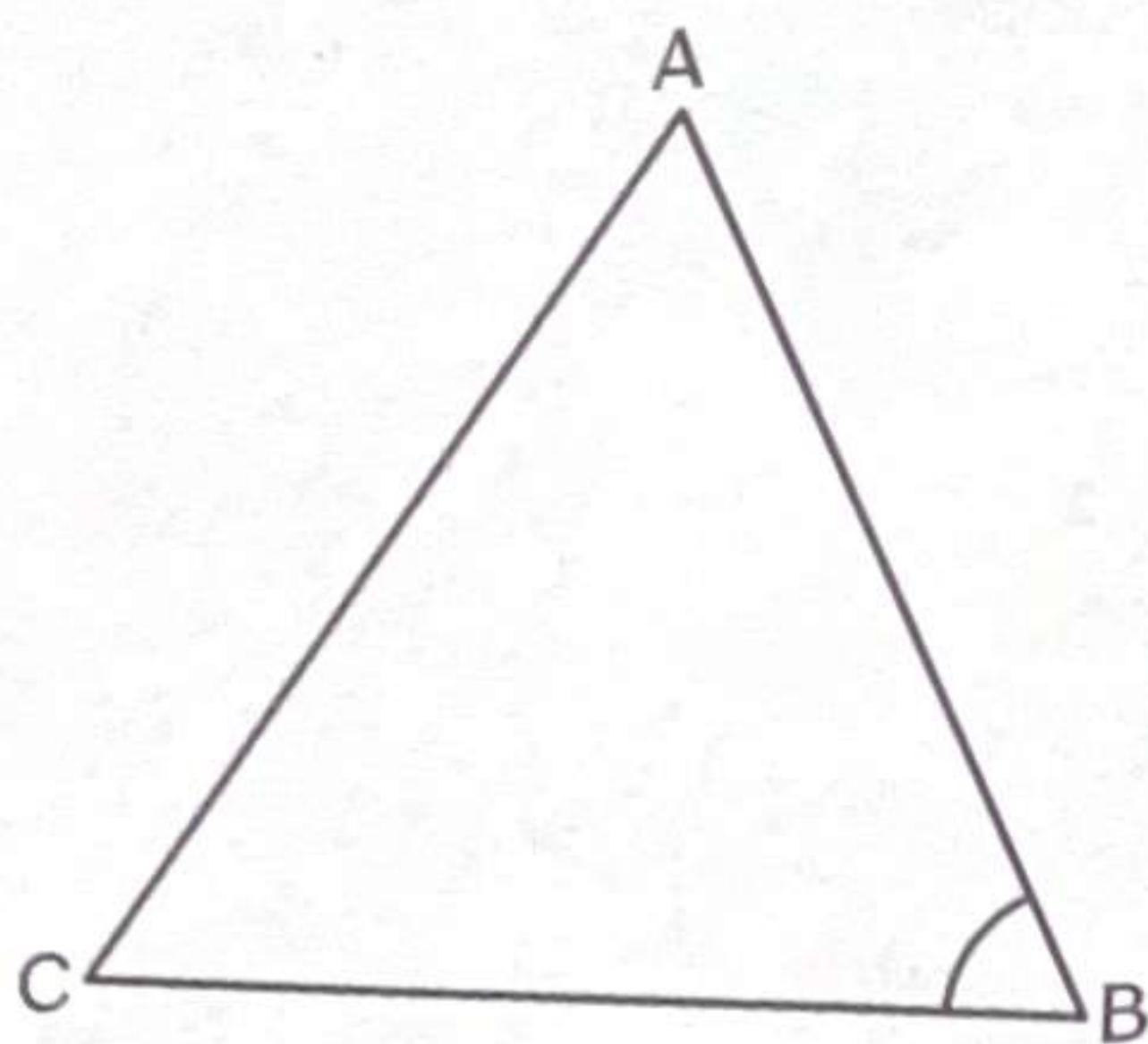
$$\angle a + \angle b + \angle c = 360^\circ$$



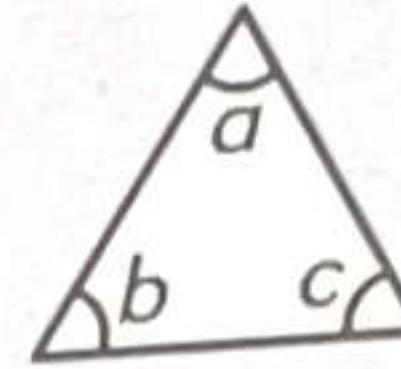
4

The sum of angles in a triangle is  $180^\circ$ .

(a) ABC is an equilateral triangle. Find  $\angle ABC$ .



All the sides and angles in an **equilateral triangle** are equal.  
Each angle is  $60^\circ$ .

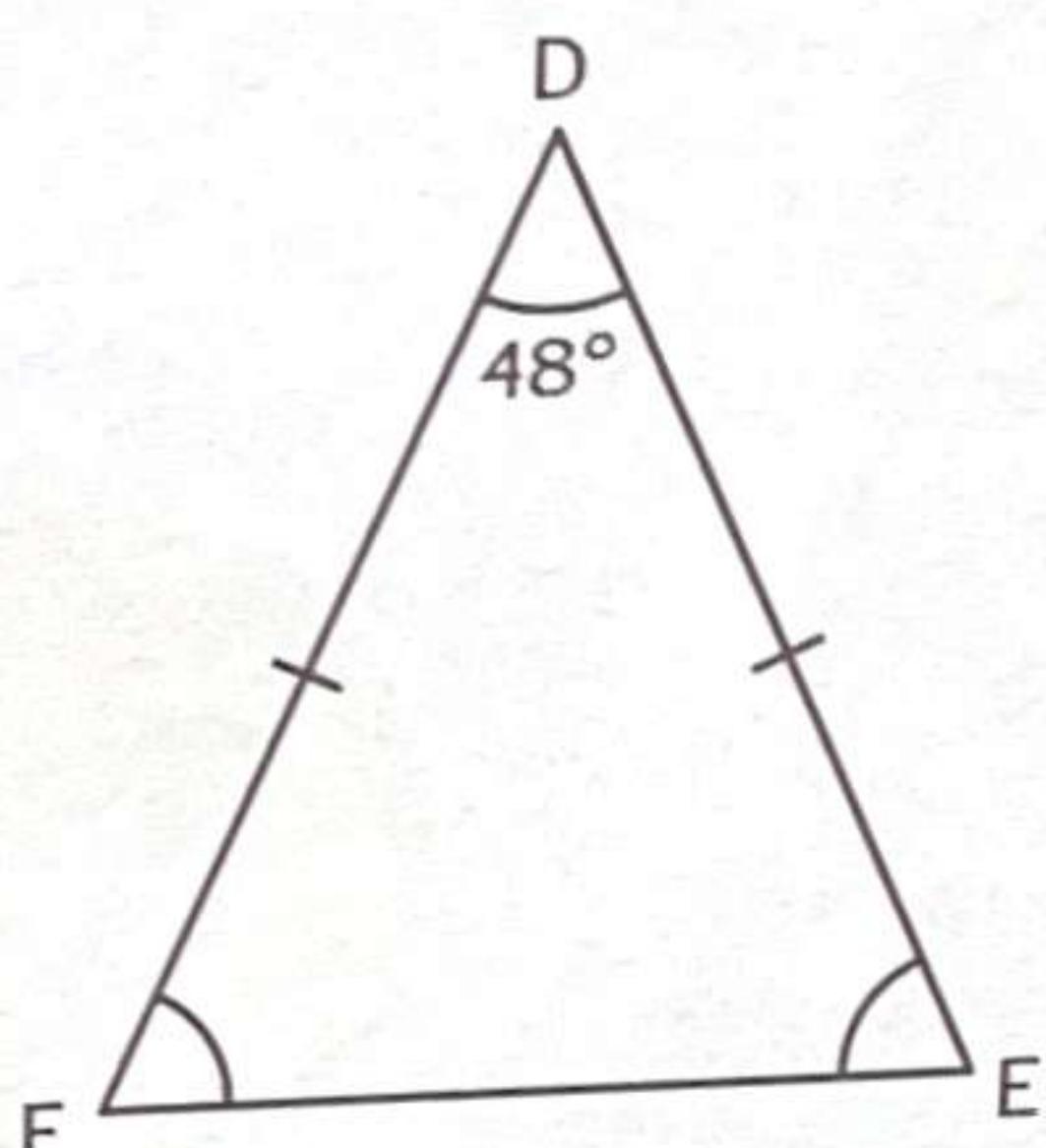


$$\angle a = \angle b = \angle c = 60^\circ$$

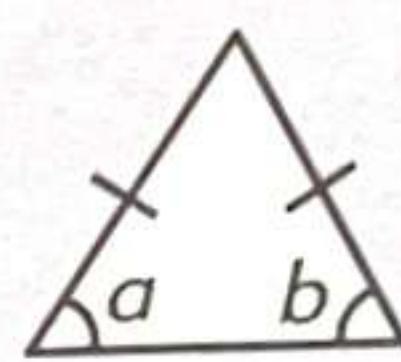


$$\angle ABC = \boxed{\quad}$$

(b) DEF is an isosceles triangle. Find  $\angle DFE$  and  $\angle DEF$ .



Two sides of the **isosceles triangle** are equal.



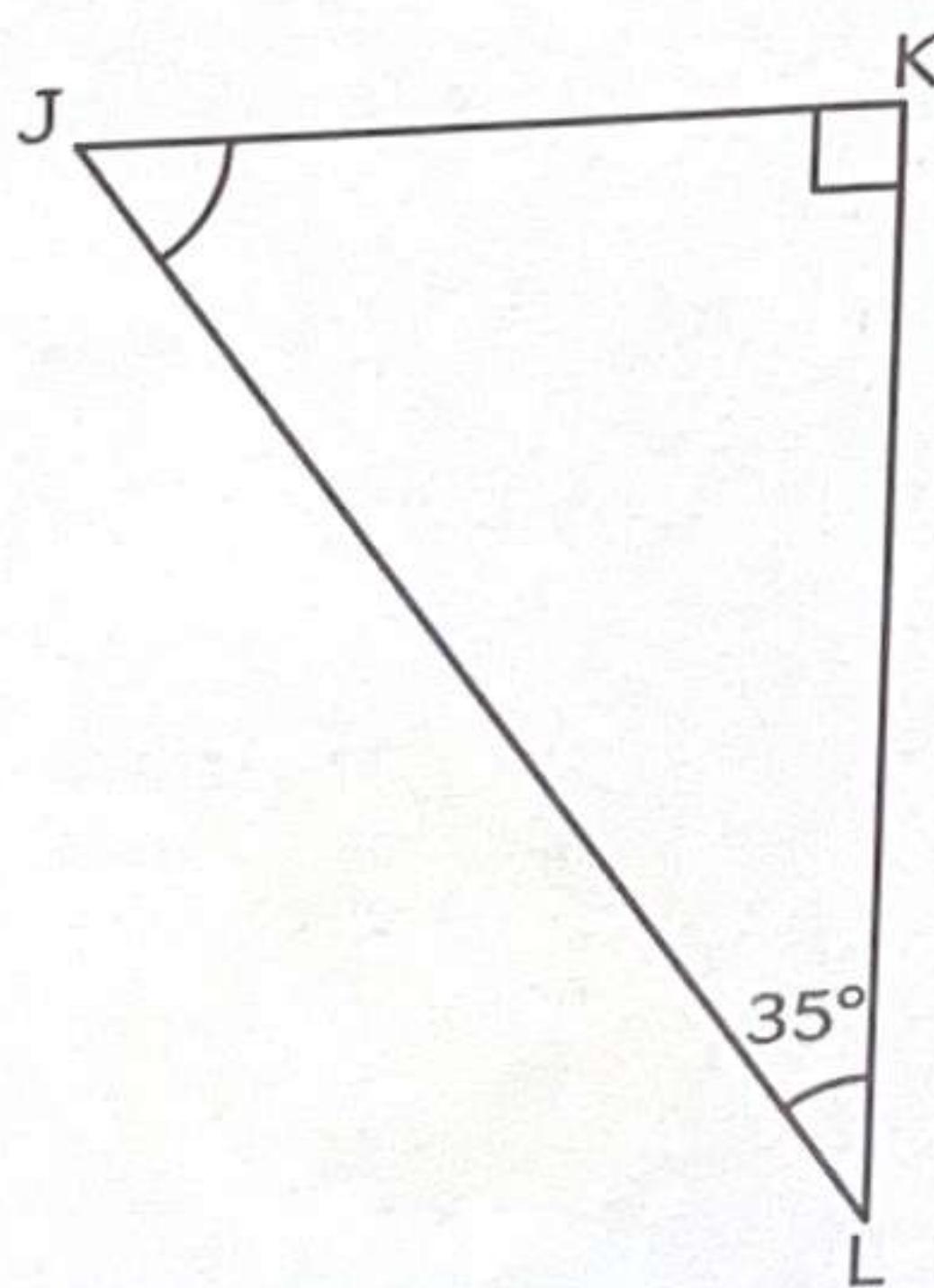
$$\angle a = \angle b$$



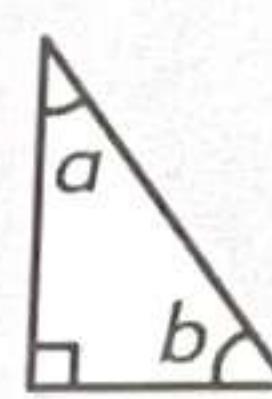
$$\angle DFE = \boxed{\quad}$$

$$\angle DEF = \boxed{\quad}$$

(c) JKL is a right-angled triangle. Find  $\angle LJK$ .



One of the angles of a **right-angled triangle** is  $90^\circ$ .  
The other 2 acute angles add up to  $90^\circ$ .



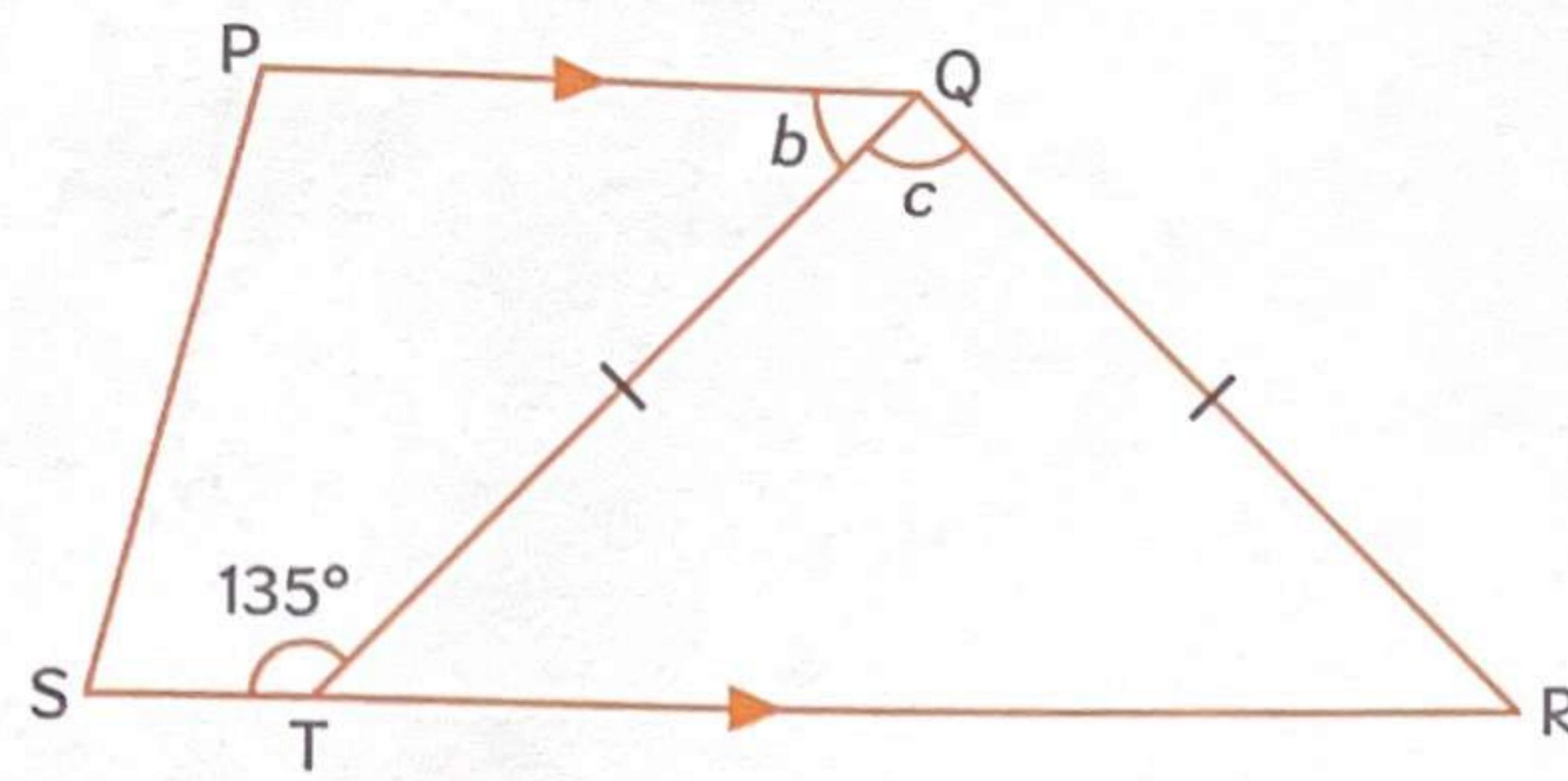
$$\angle a + \angle b = 90^\circ$$



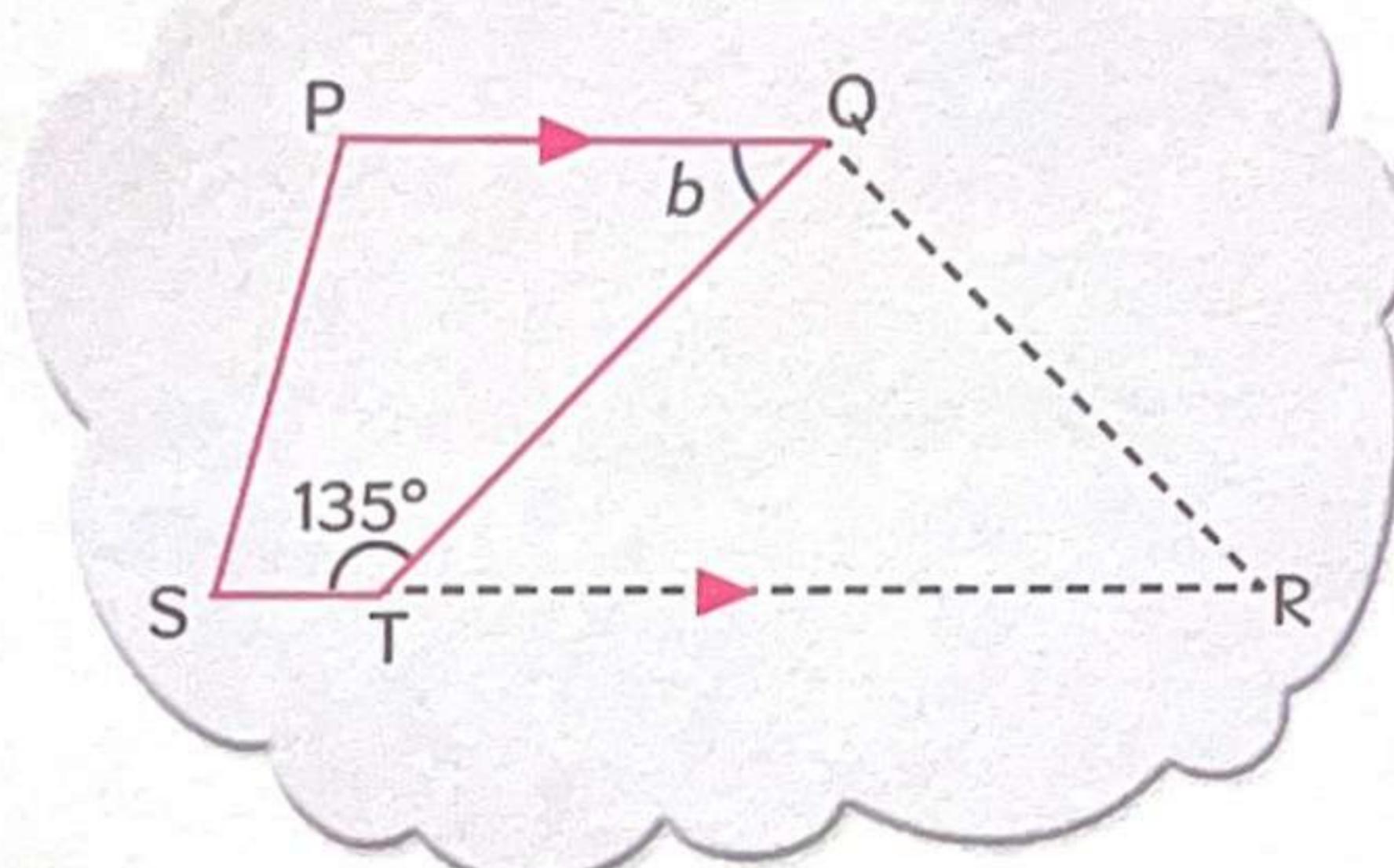
$$\angle LJK = \boxed{\quad}$$

PQRS is a trapezium.

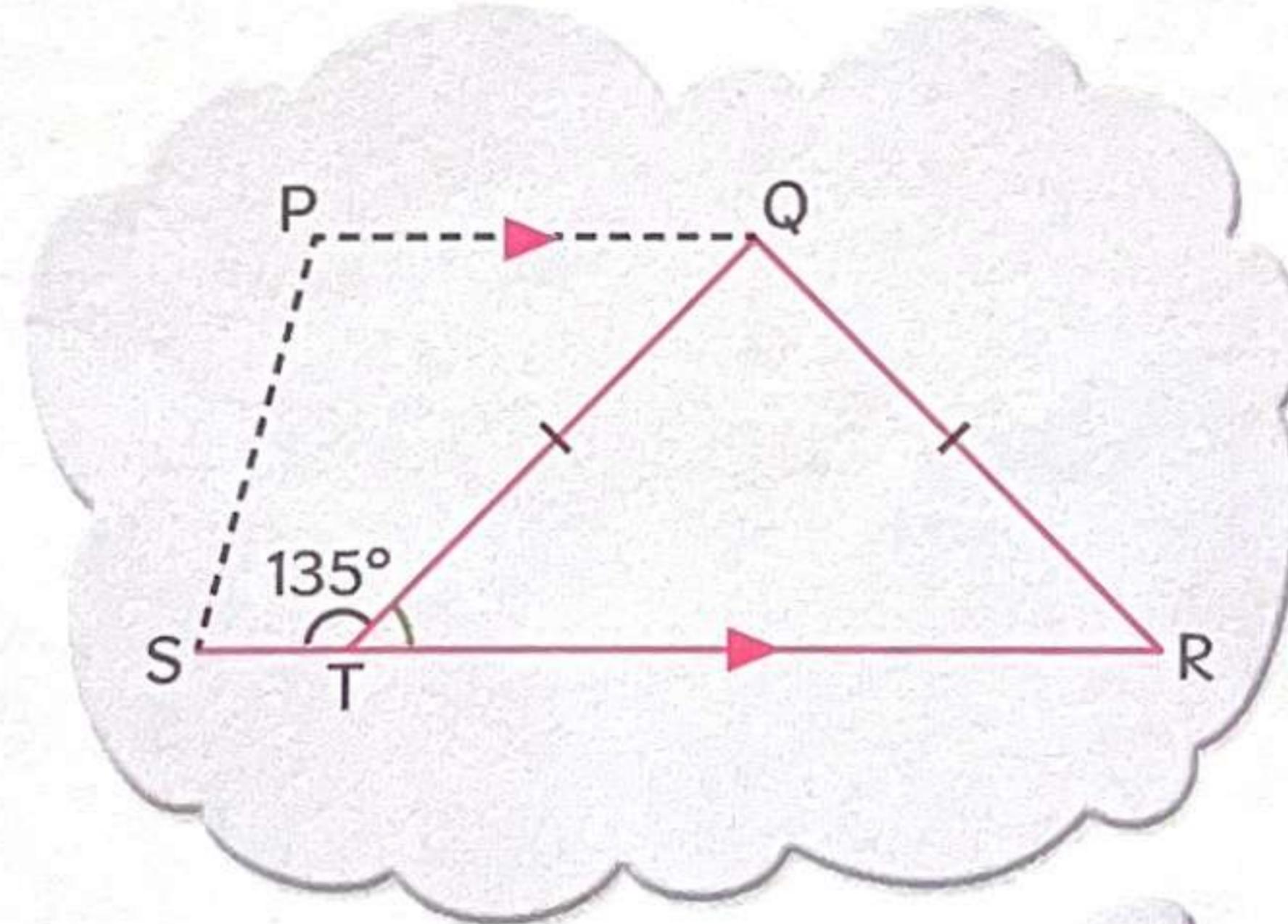
QRT is an isosceles triangle and  $QR = QT$ .  $\angle QTS = 135^\circ$ .  
Find  $\angle b$  and  $\angle c$ .



$$\begin{aligned}\angle b &= 180^\circ - 135^\circ \\ &= 45^\circ\end{aligned}$$

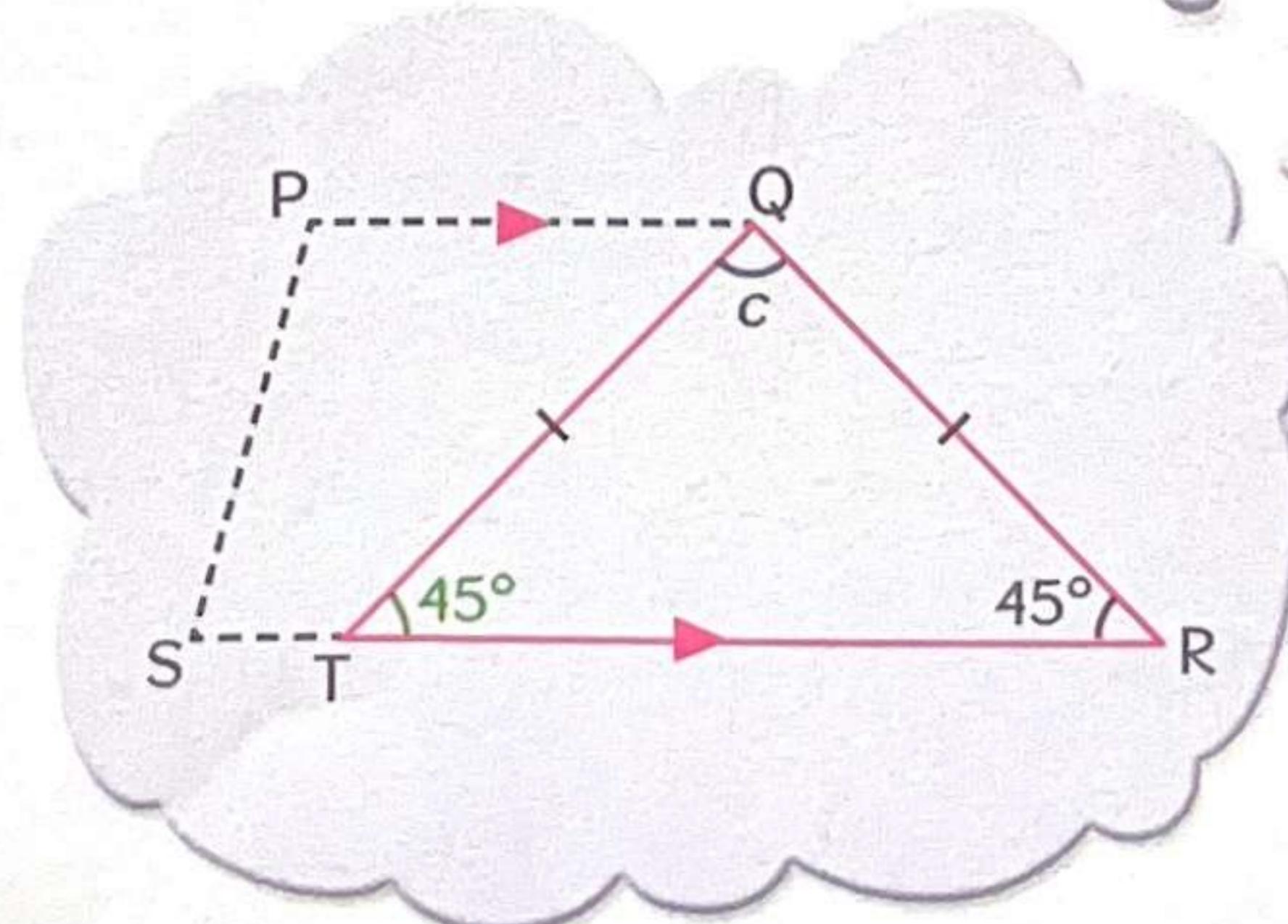


$$\begin{aligned}\angle QTR &= 180^\circ - 135^\circ \\ &= 45^\circ\end{aligned}$$



$$\angle QTR = \angle QRT$$

$$\begin{aligned}\angle c &= 180^\circ - 45^\circ - 45^\circ \\ &= 90^\circ\end{aligned}$$

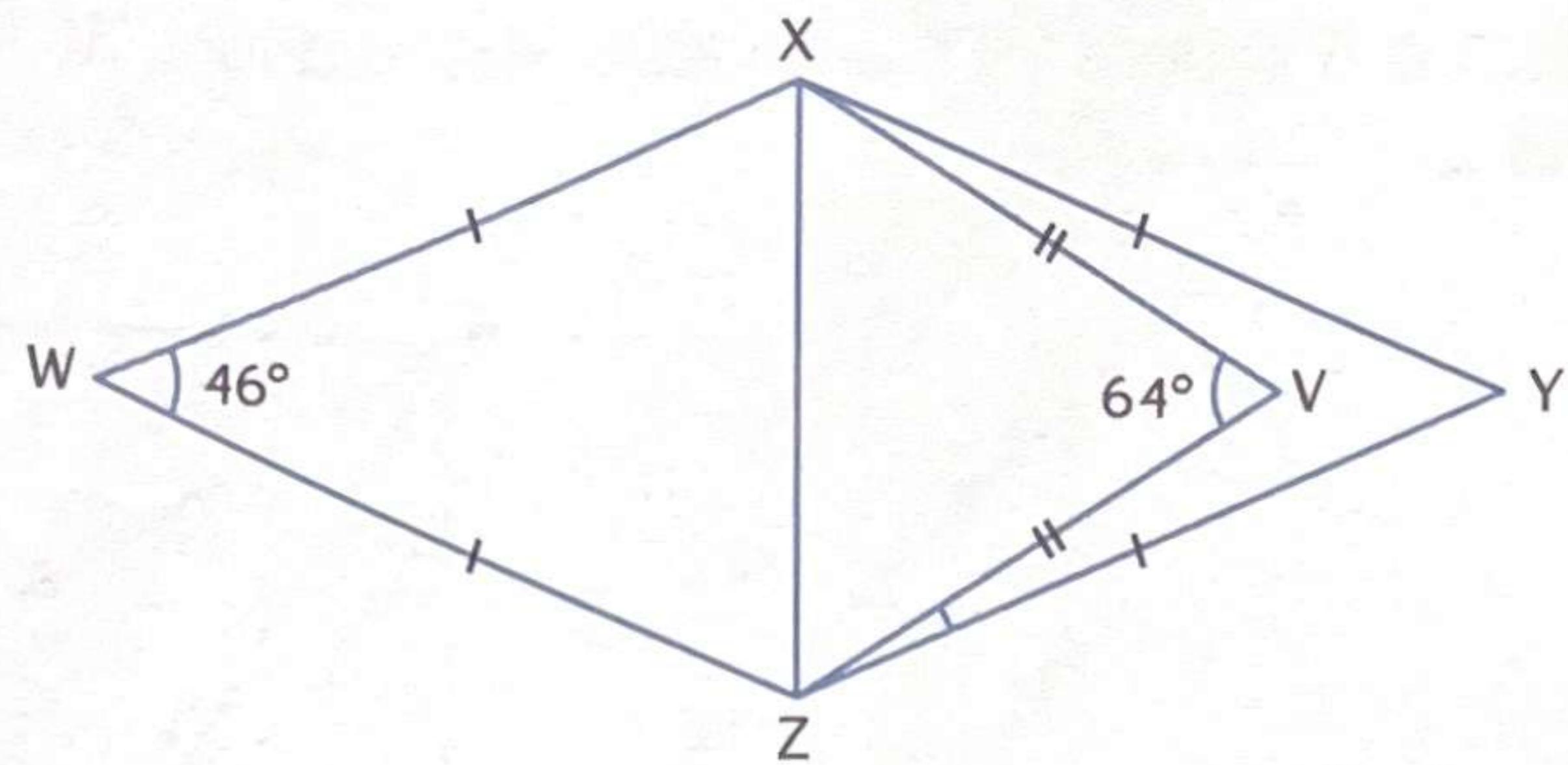


$WXYZ$  is a rhombus.

$XVZ$  is an isosceles triangle.

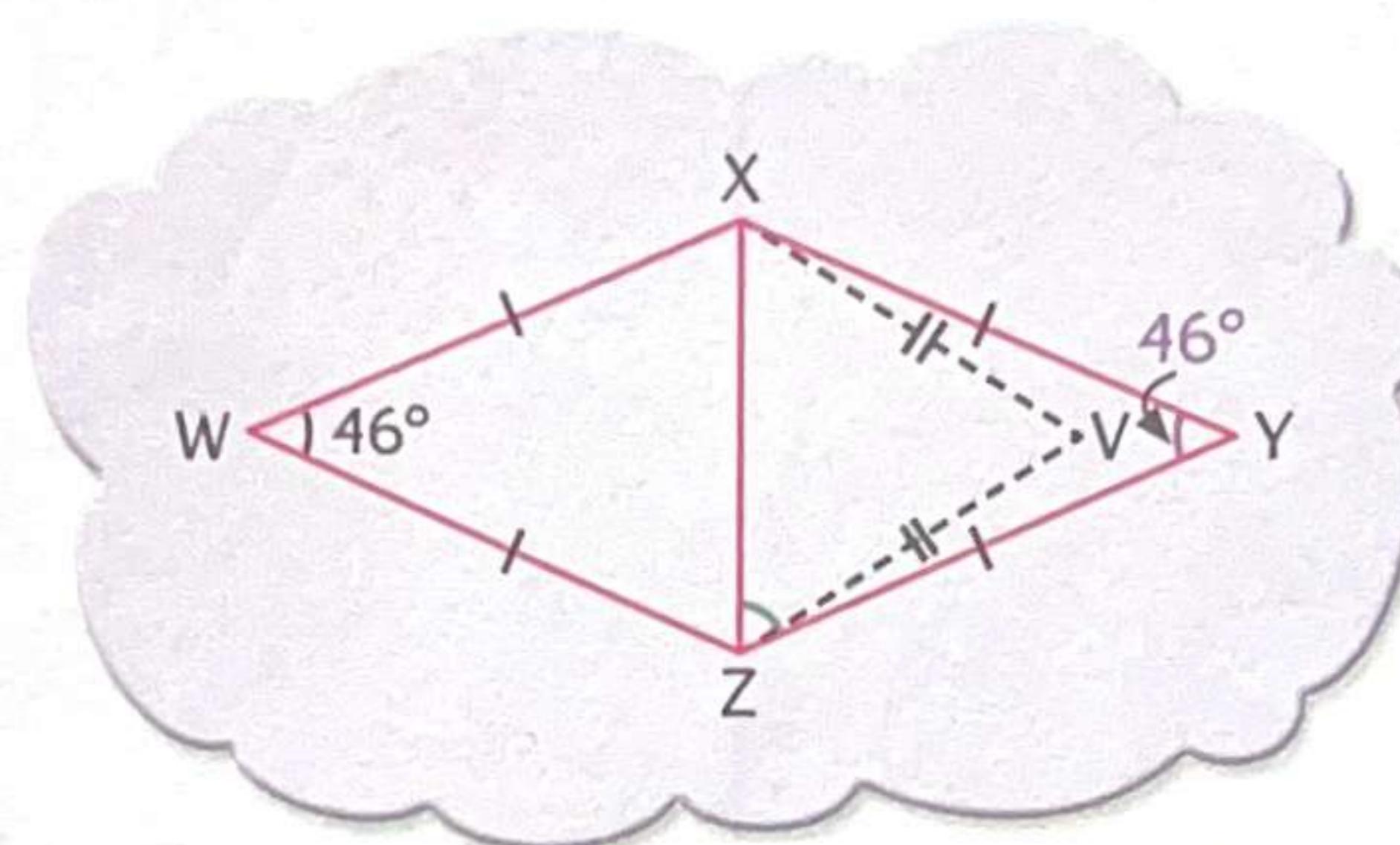
$\angle XWZ = 46^\circ$  and  $\angle XVZ = 64^\circ$ .

Find  $\angle VZY$ .

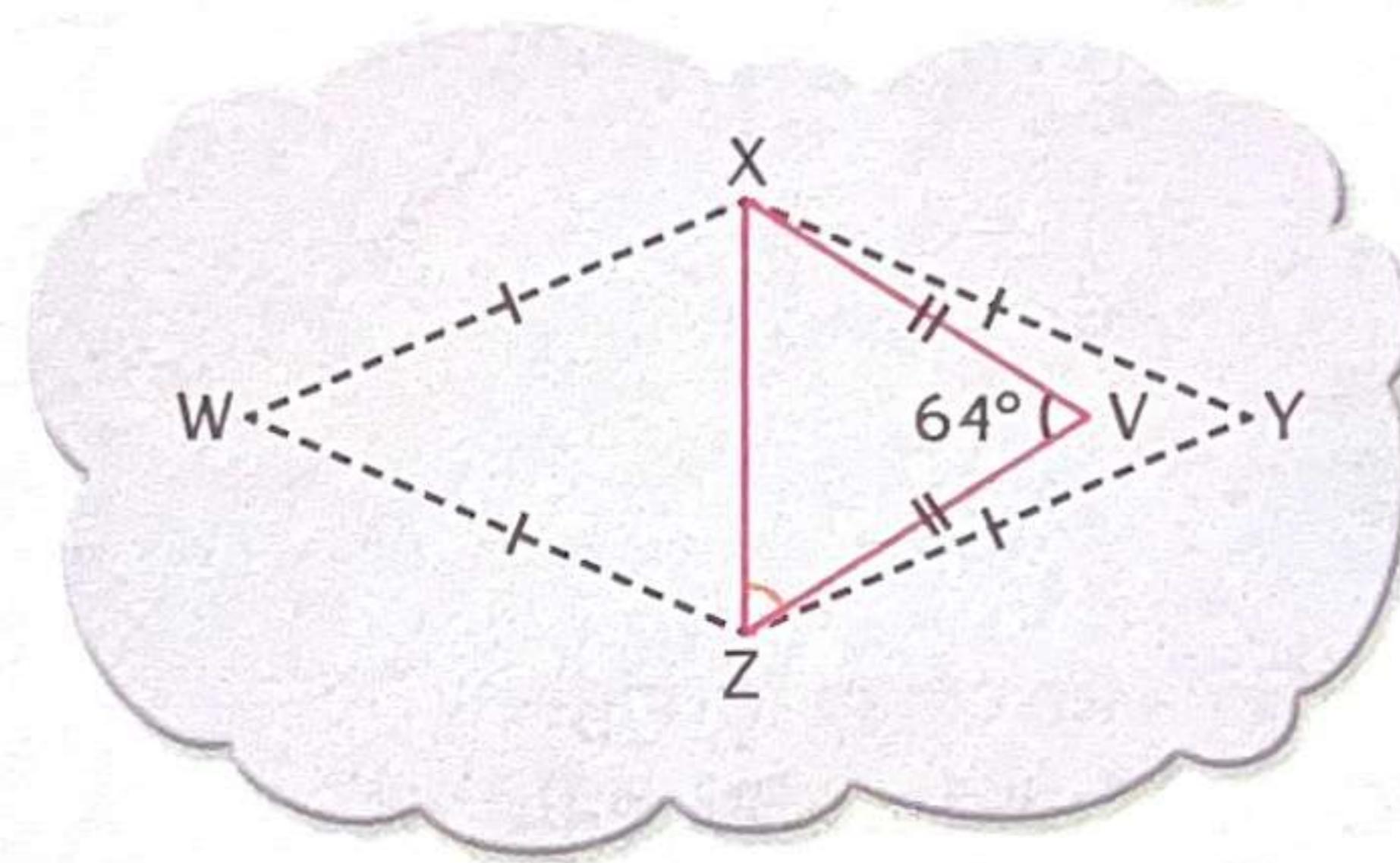


$$\angle XYZ = 46^\circ$$

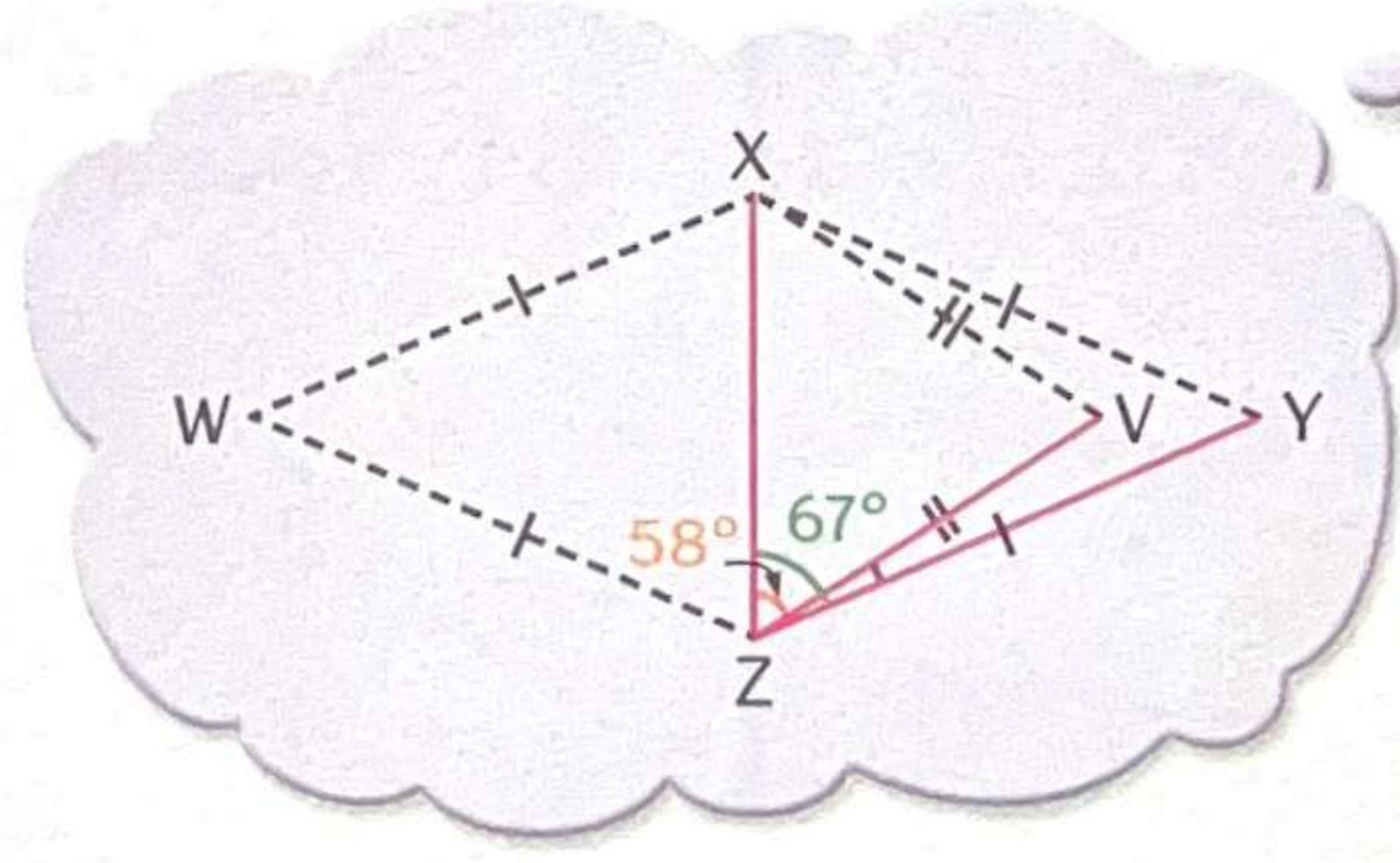
$$\begin{aligned}\angle XZY &= (180^\circ - 46^\circ) \div 2 \\ &= 67^\circ\end{aligned}$$



$$\begin{aligned}\angle XZV &= (180^\circ - 64^\circ) \div 2 \\ &= 58^\circ\end{aligned}$$

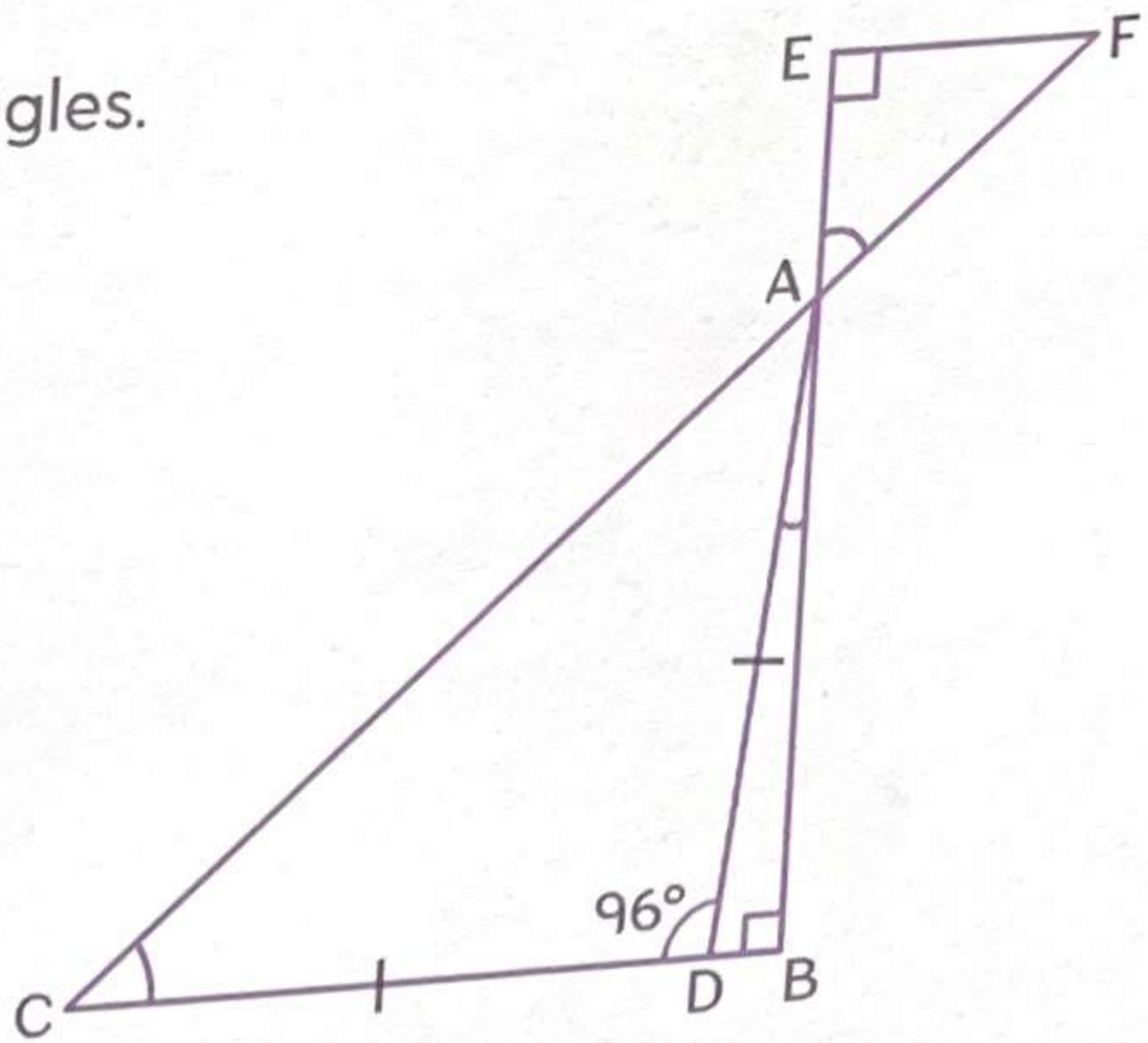


$$\begin{aligned}\angle VZY &= 67^\circ - 58^\circ \\ &= 9^\circ\end{aligned}$$



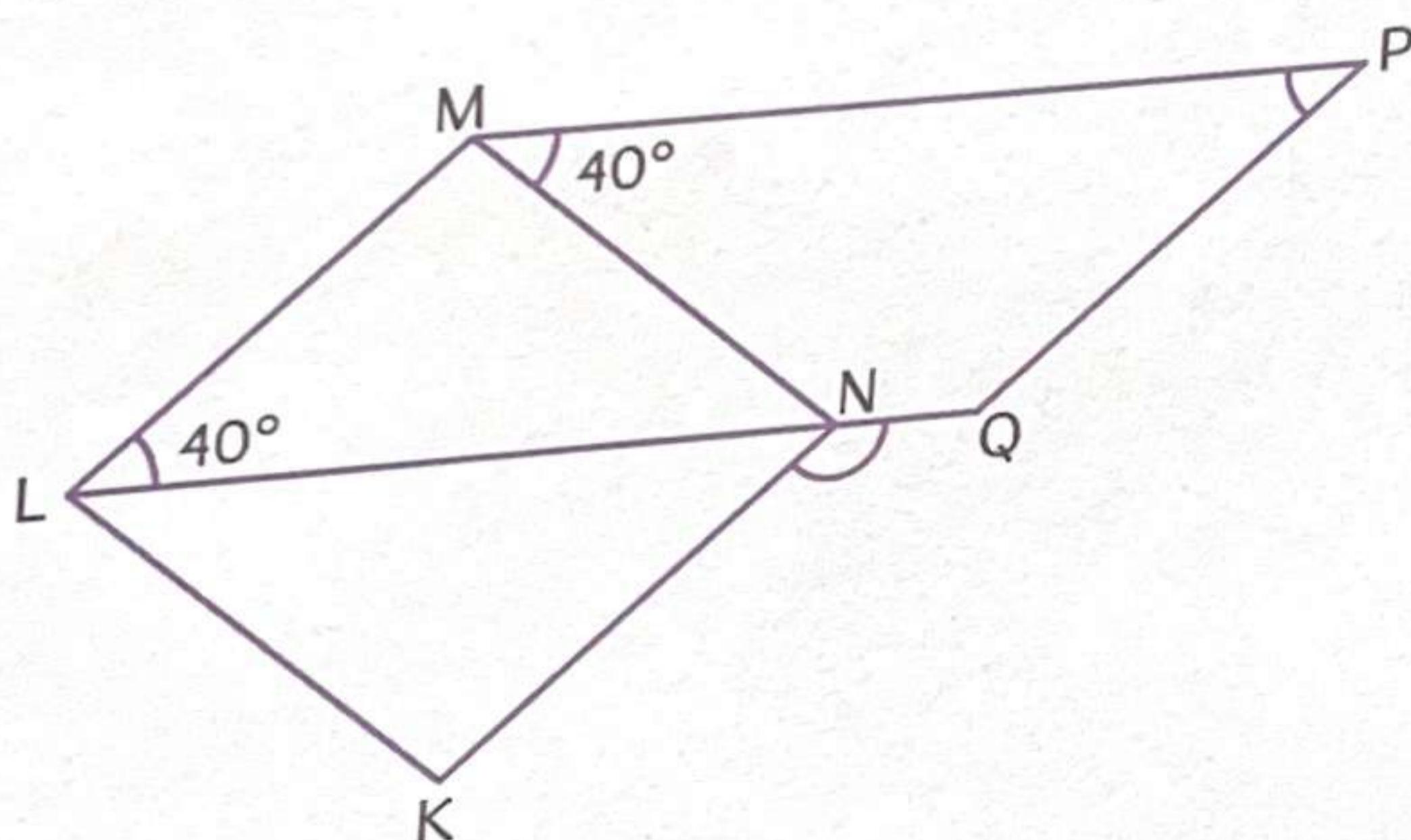
- (a) ABC and AEF are right-angled triangles.  
 EB and CF are straight lines.  
 ADC is an isosceles triangle.  
 $\angle ADC = 96^\circ$ .

- (i) Find  $\angle ACD$ .  
 (ii) Find  $\angle DAB$ .  
 (iii) Find  $\angle FAE$ .



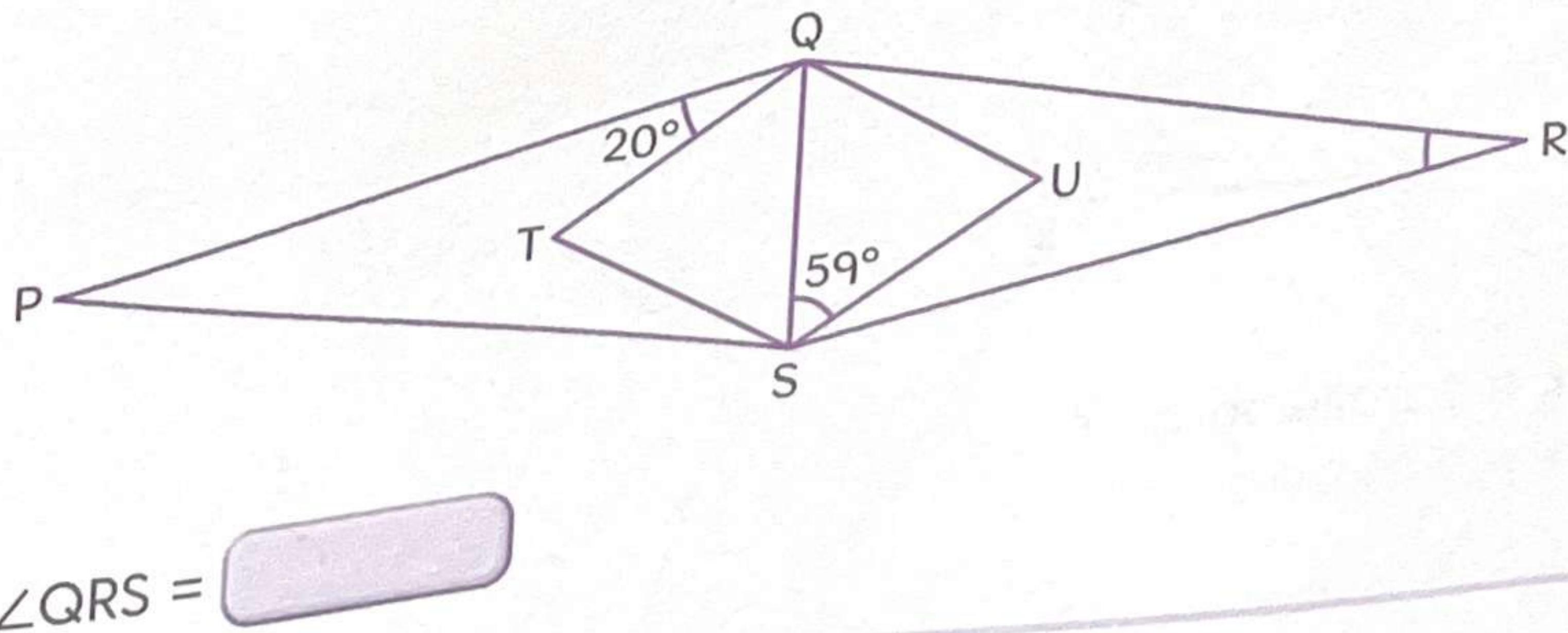
- (i)  $\angle ACD =$    
 (ii)  $\angle DAB =$    
 (iii)  $\angle FAE =$

- (b) KLMN is a rhombus and LMPQ is a parallelogram.  $\angle NMP = \angle MLQ = 40^\circ$ .  
 Find  $\angle MPQ$  and  $\angle KNQ$ .



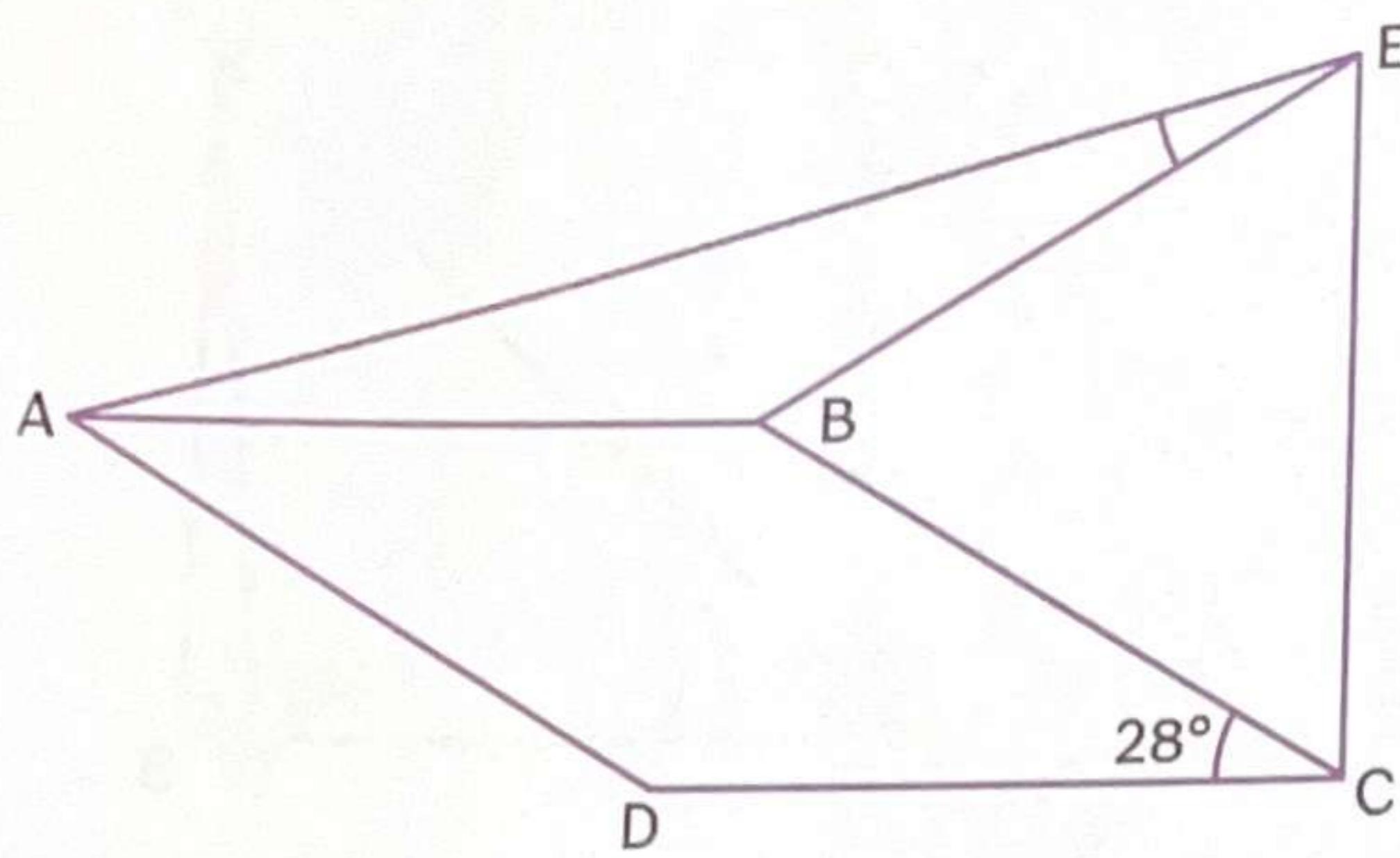
- $\angle MPQ =$    
 $\angle KNQ =$

- (c) PQRS and TQU are rhombuses.  $\angle PQT = 20^\circ$  and  $\angle QSU = 59^\circ$ .  
 Find  $\angle QRS$ .



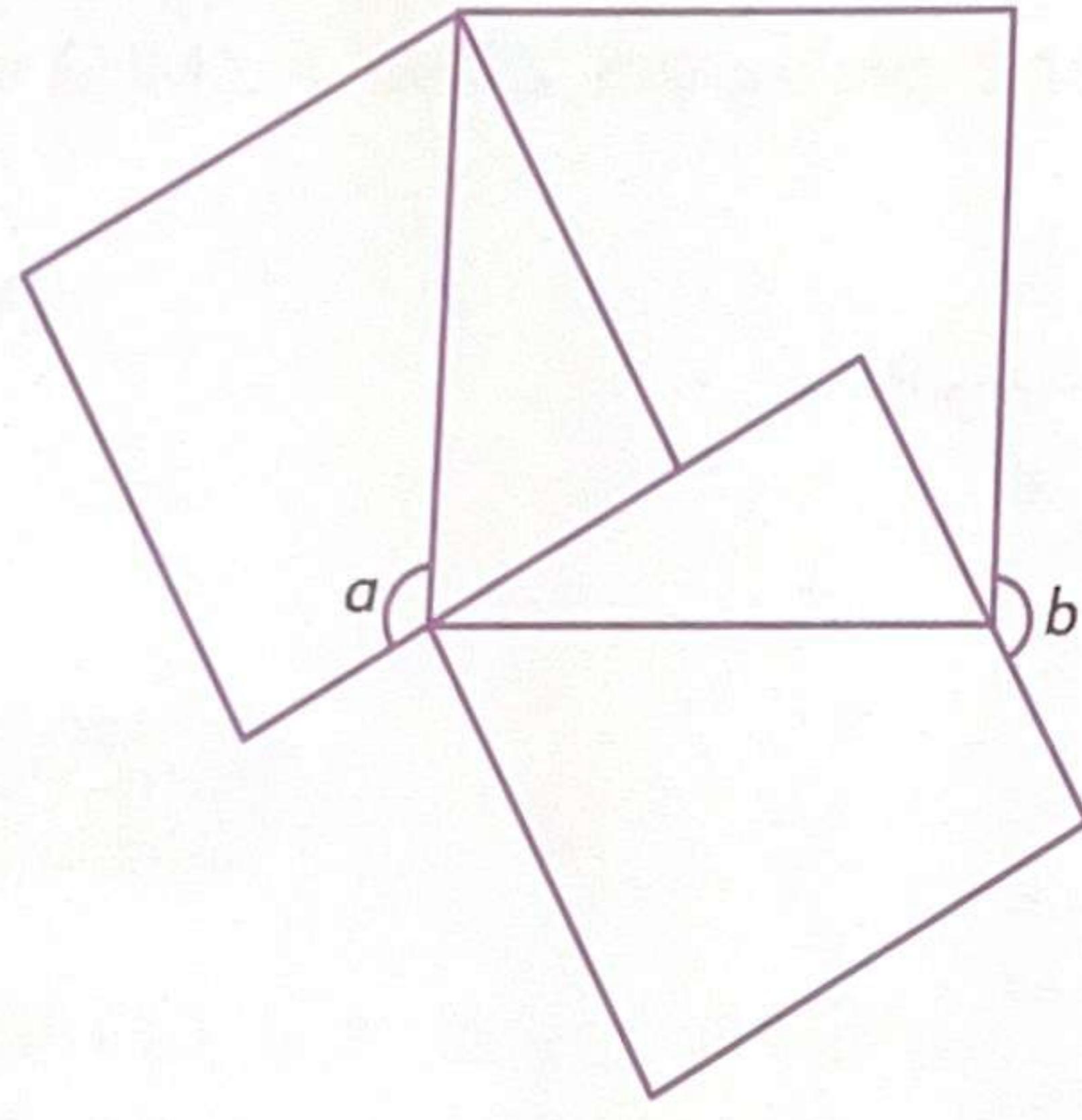
- $\angle QRS =$

- (d) In the figure, ABCD is a rhombus and BEC is an equilateral triangle. Find  $\angle AEB$ .



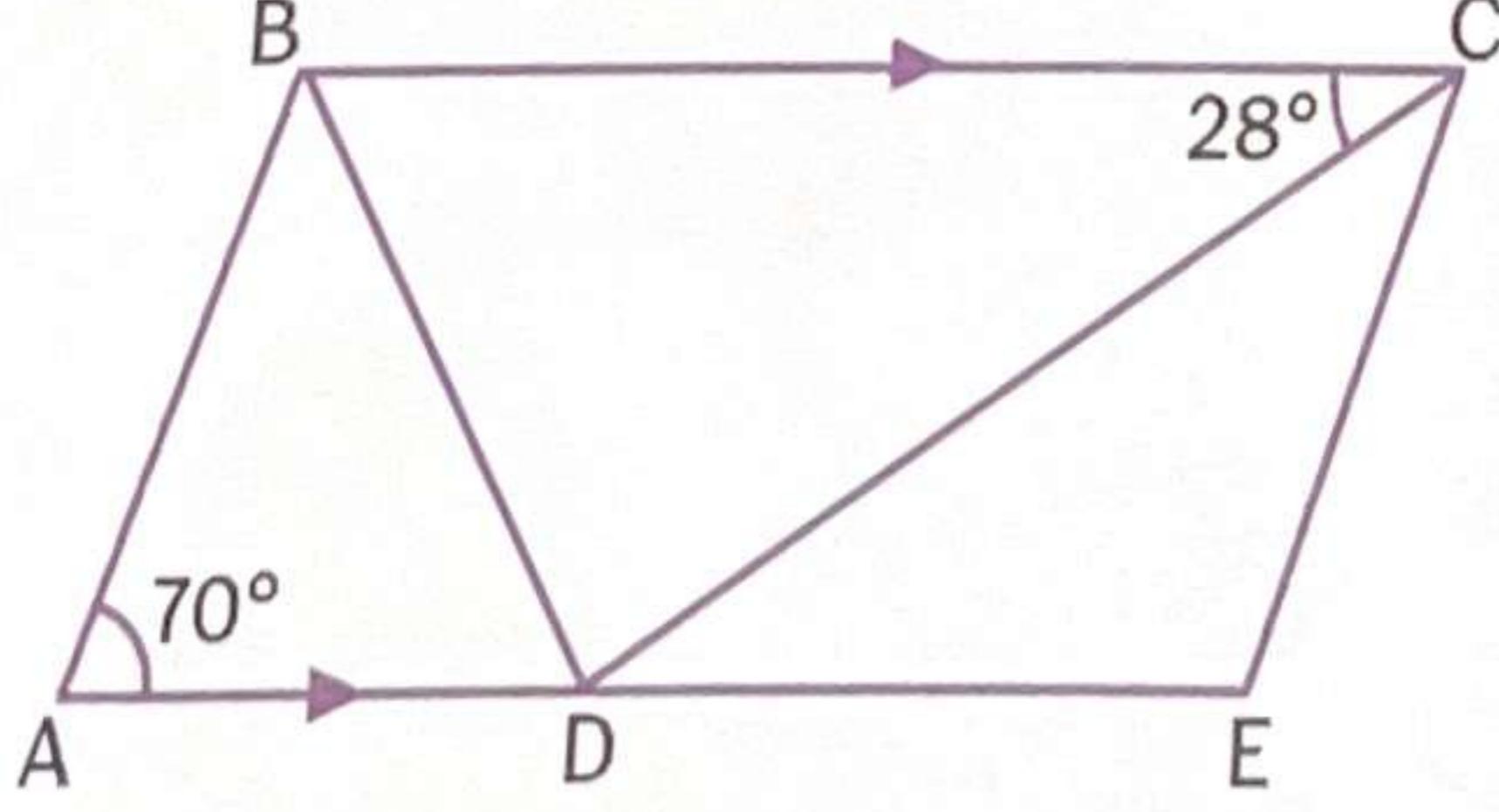
$$\angle AEB = \boxed{\quad}$$

- (e) The figure is made up of a big square and two identical smaller squares. Given that  $\angle a = 120^\circ$ , find  $\angle b$ .



$$\angle b = \boxed{\quad}$$

- (f) ABCD is a trapezium. ADE is a straight line.  
 $EC = ED$ .



Is ABCE a parallelogram?  
Explain your answer.