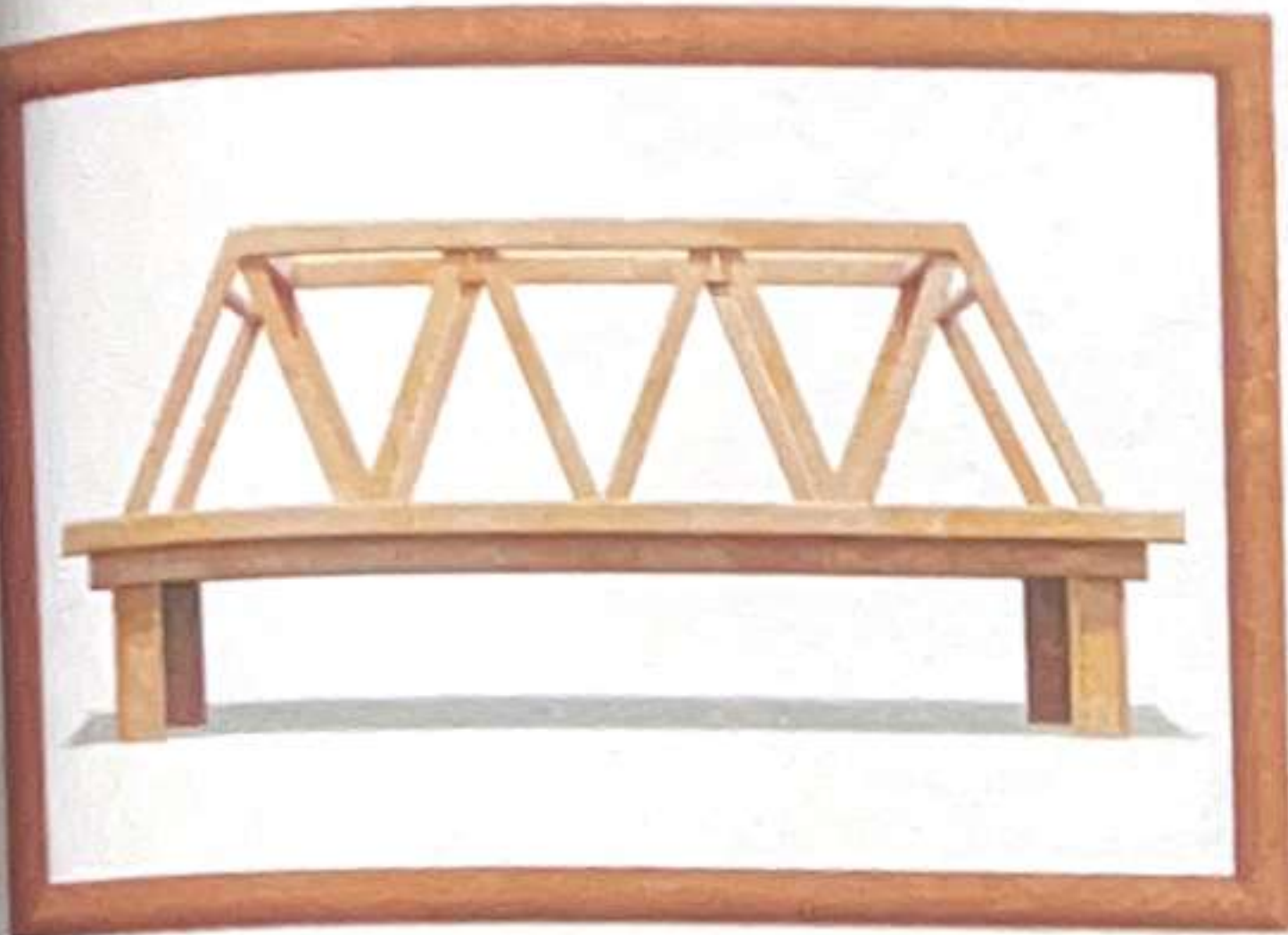


# 4

## Angles in Geometrical Figures

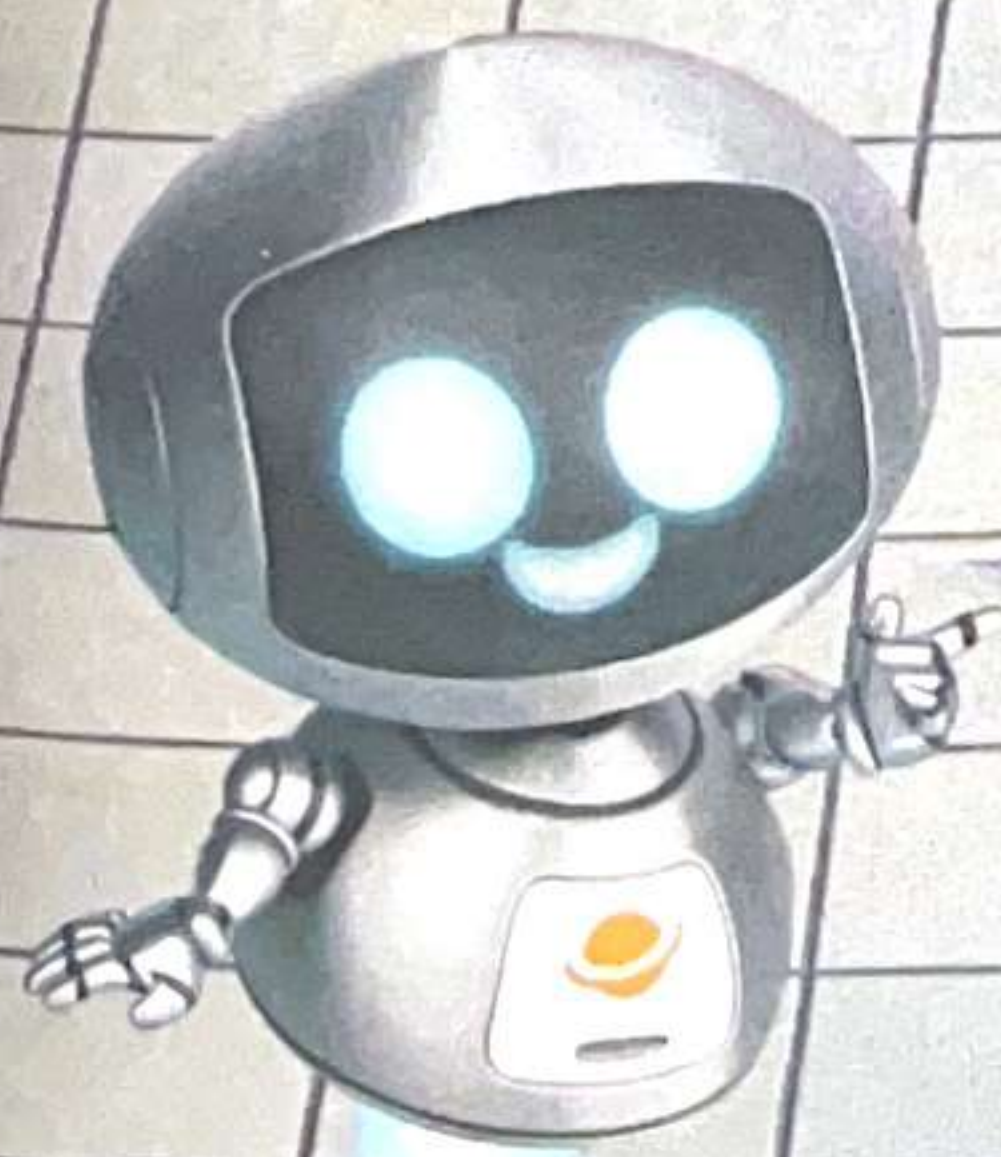


I can see some 4-sided figures in the design of the bridge.

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?



SINGAPORE  
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LEARNING SPACE

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

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



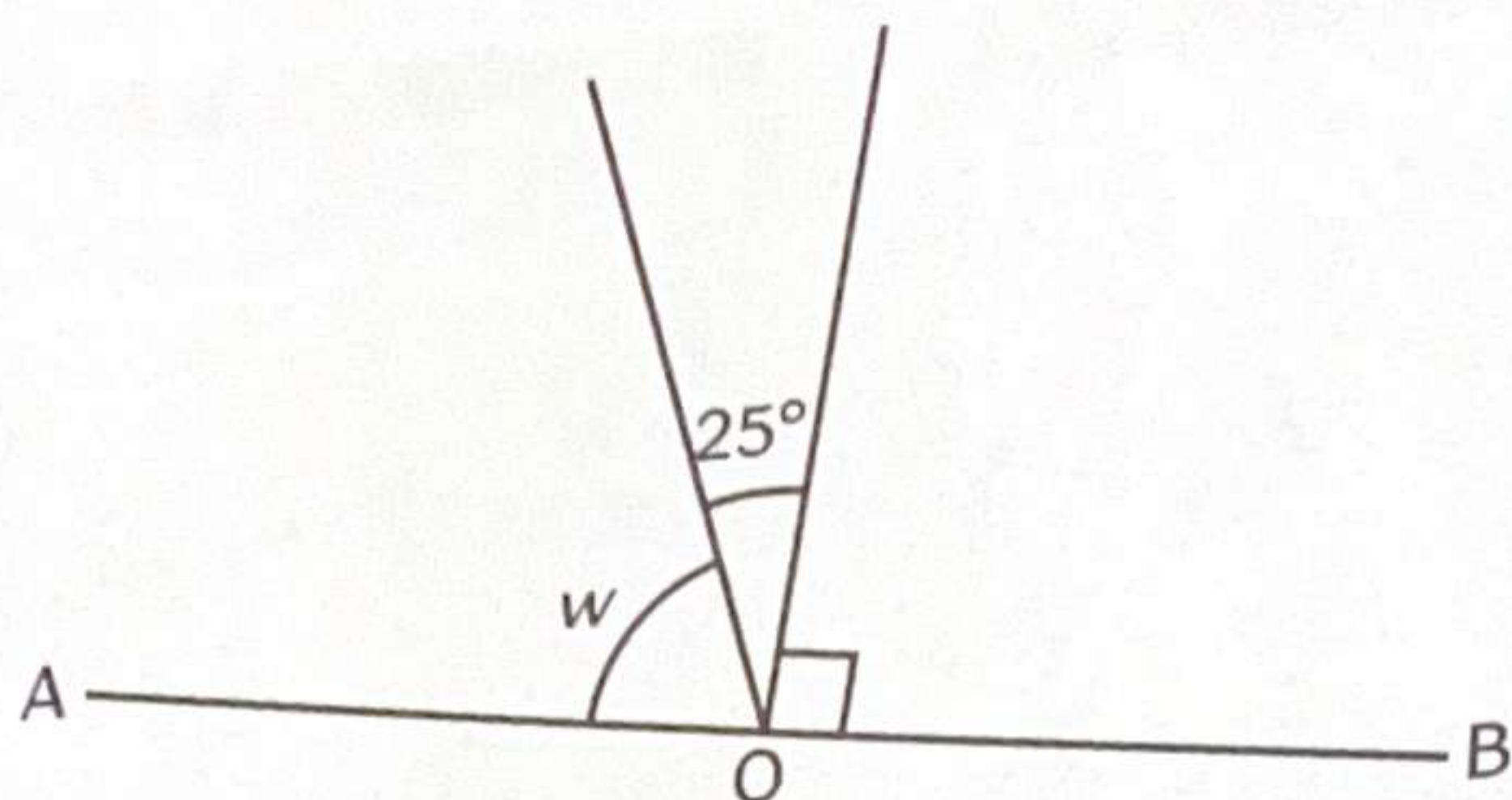


# Finding Unknown Angles



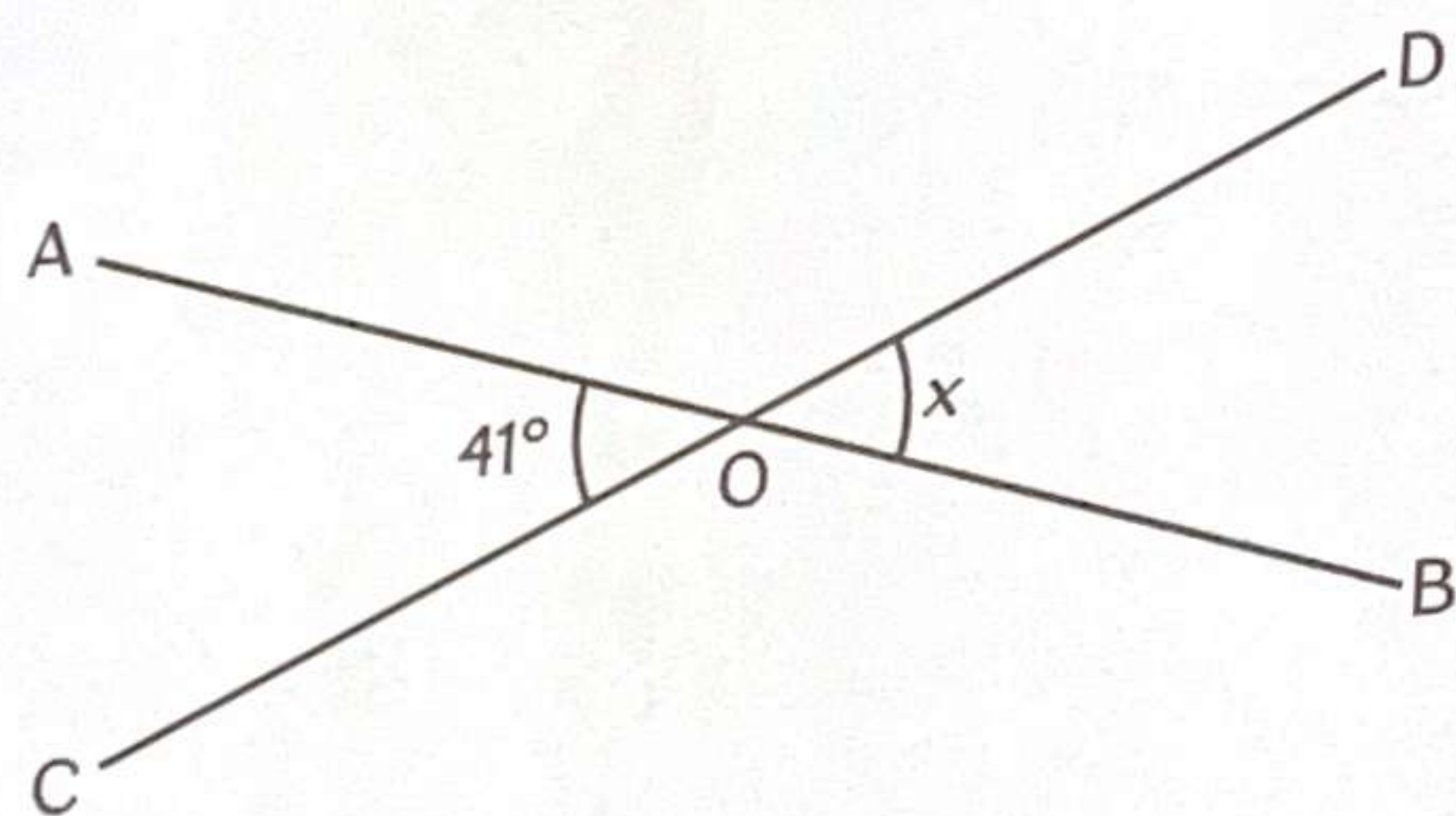
## Recall

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



$\angle w =$

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



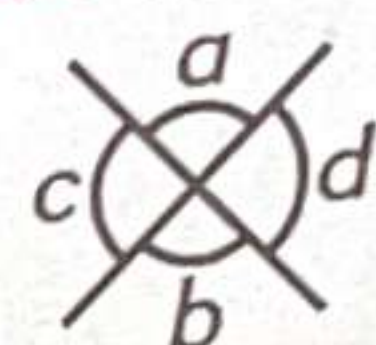
$\angle x =$

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

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



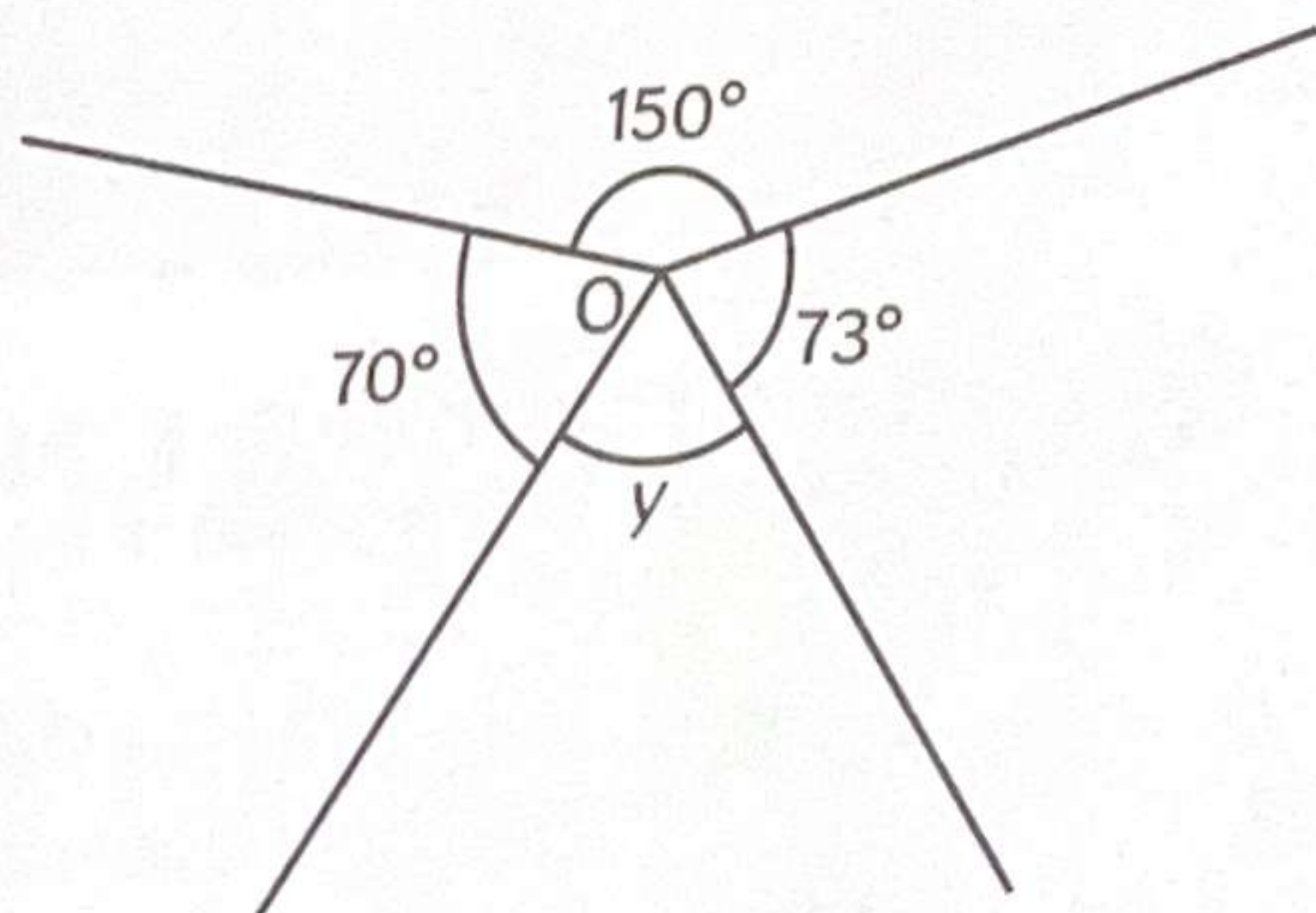
**Vertically opposite angles** are **equal**.



$$\begin{aligned}\angle a &= \angle b \\ \angle c &= \angle d\end{aligned}$$



- 3 Find  $\angle y$ .



$\angle y =$

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

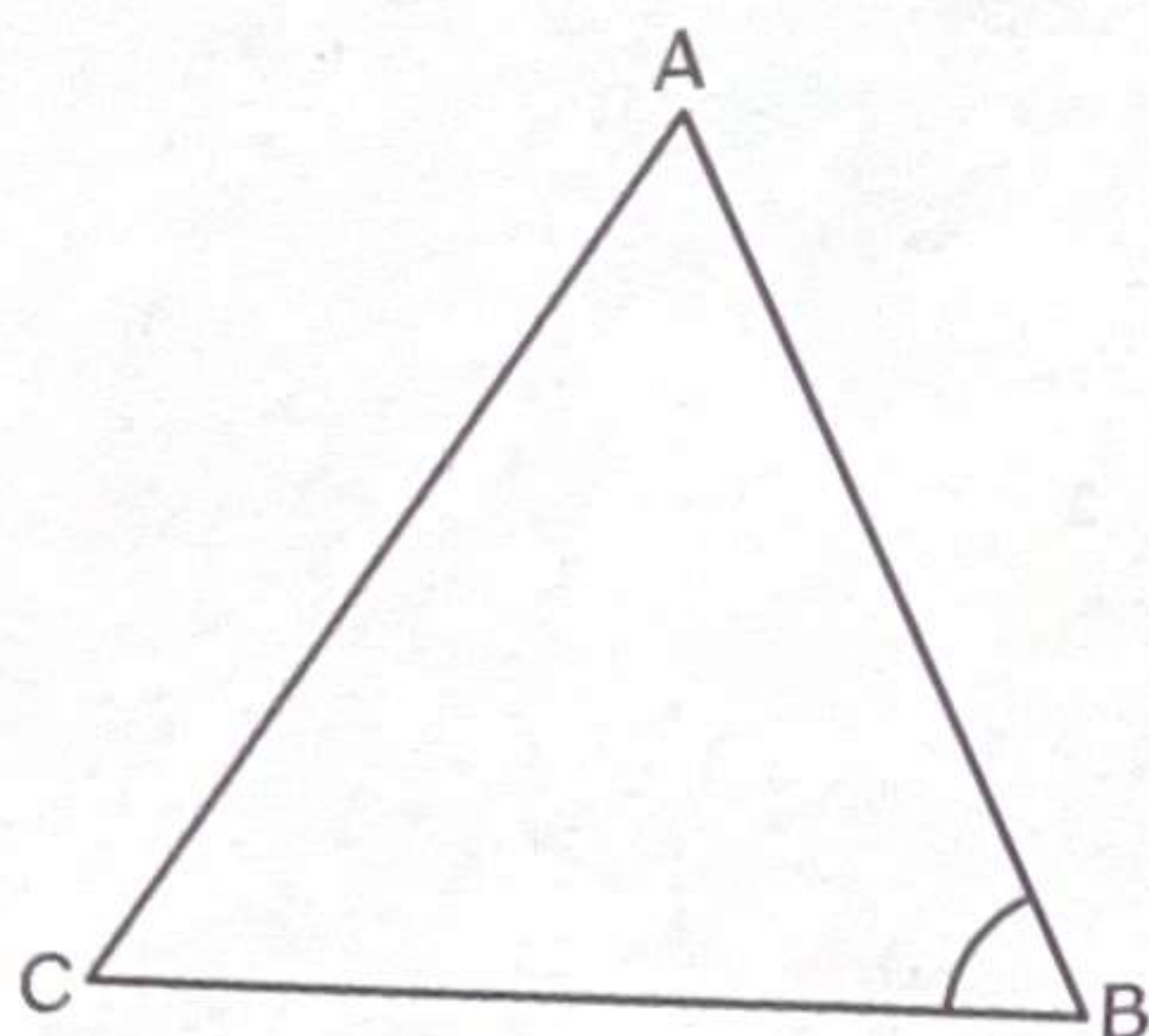


$$\angle a + \angle b + \angle c = 360^\circ$$



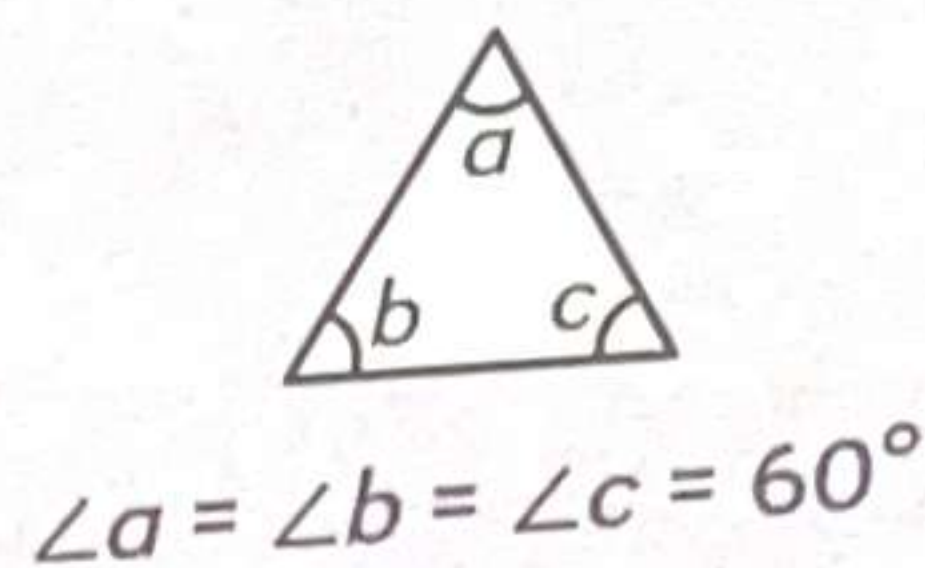


- 4 The **sum of angles in a triangle** is  $180^\circ$ .  
 (a) ABC is an equilateral triangle. Find  $\angle ABC$ .

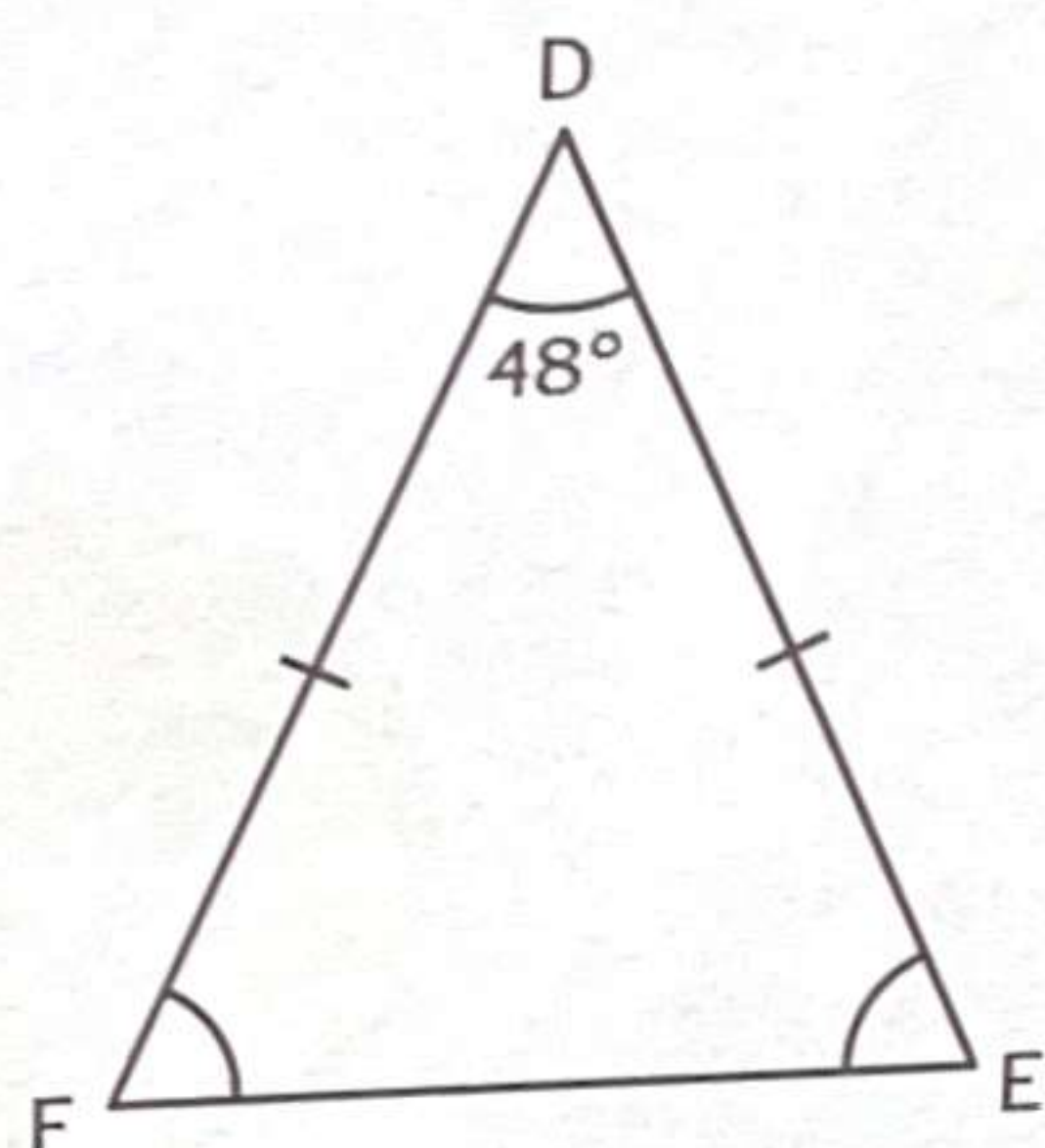


$\angle ABC =$

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



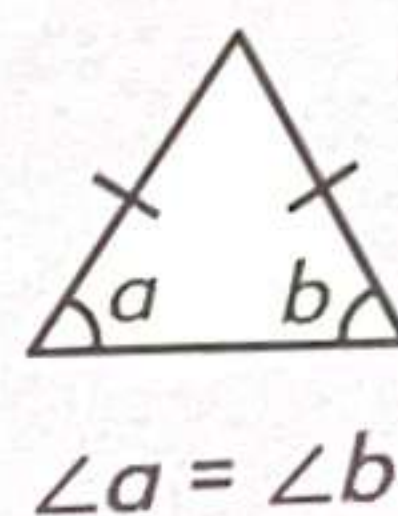
- (b) DEF is an isosceles triangle. Find  $\angle DFE$  and  $\angle DEF$ .



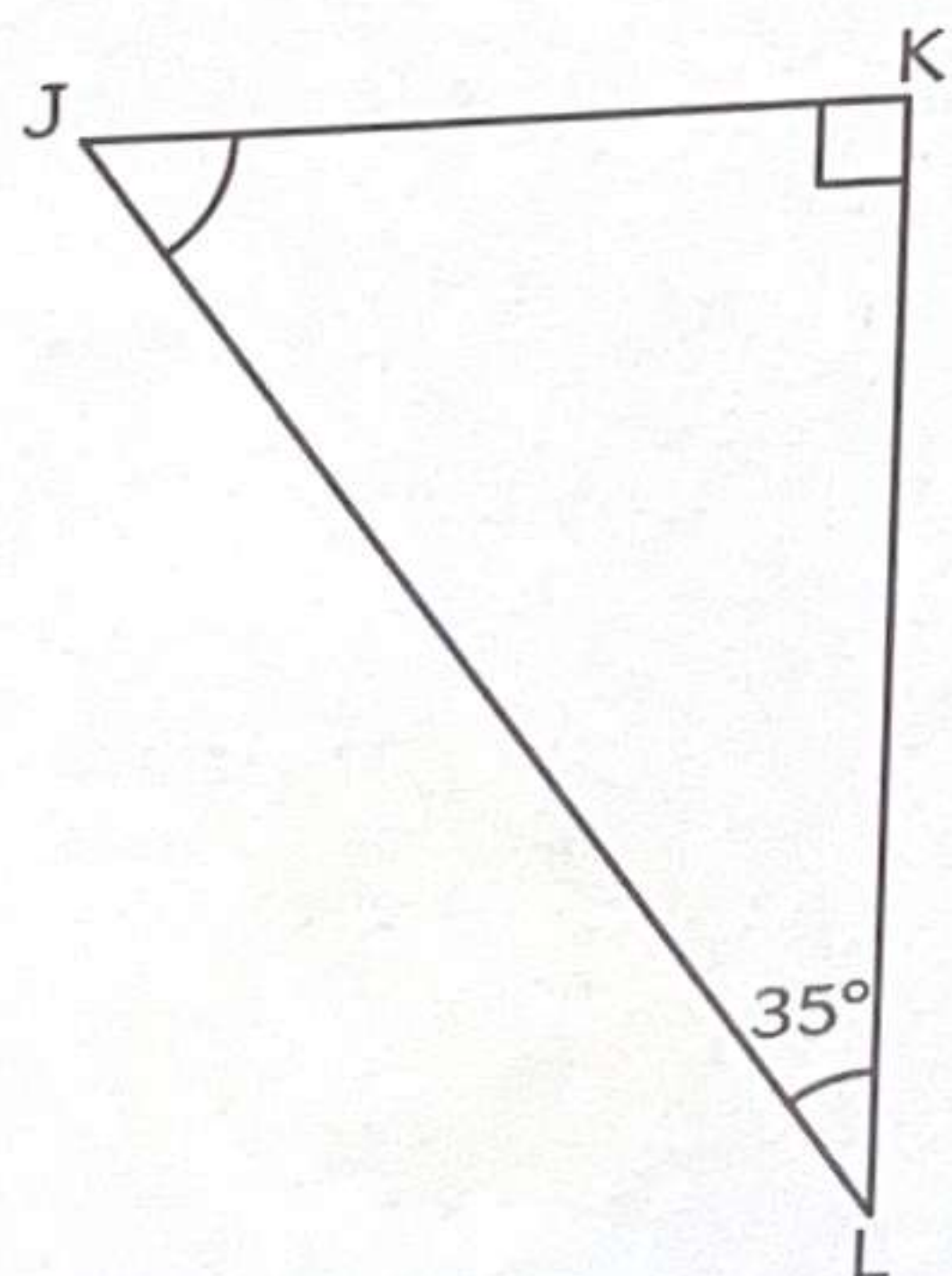
$\angle DFE =$

$\angle DEF =$

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

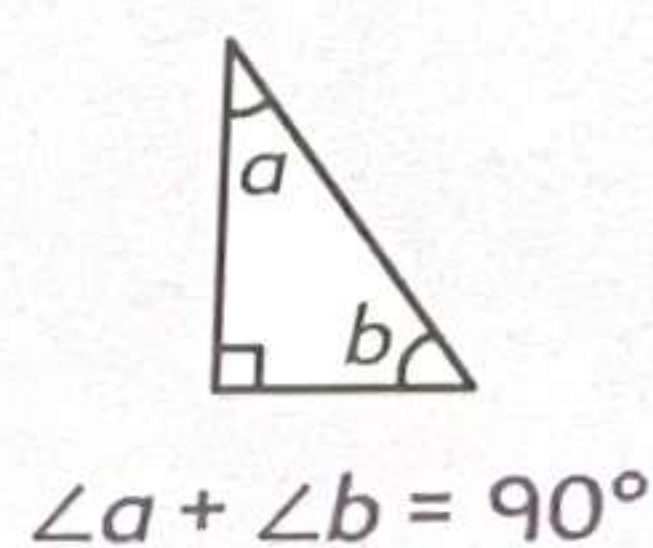


- (c) JKL is a right-angled triangle. Find  $\angle LJK$ .



$\angle LJK =$

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

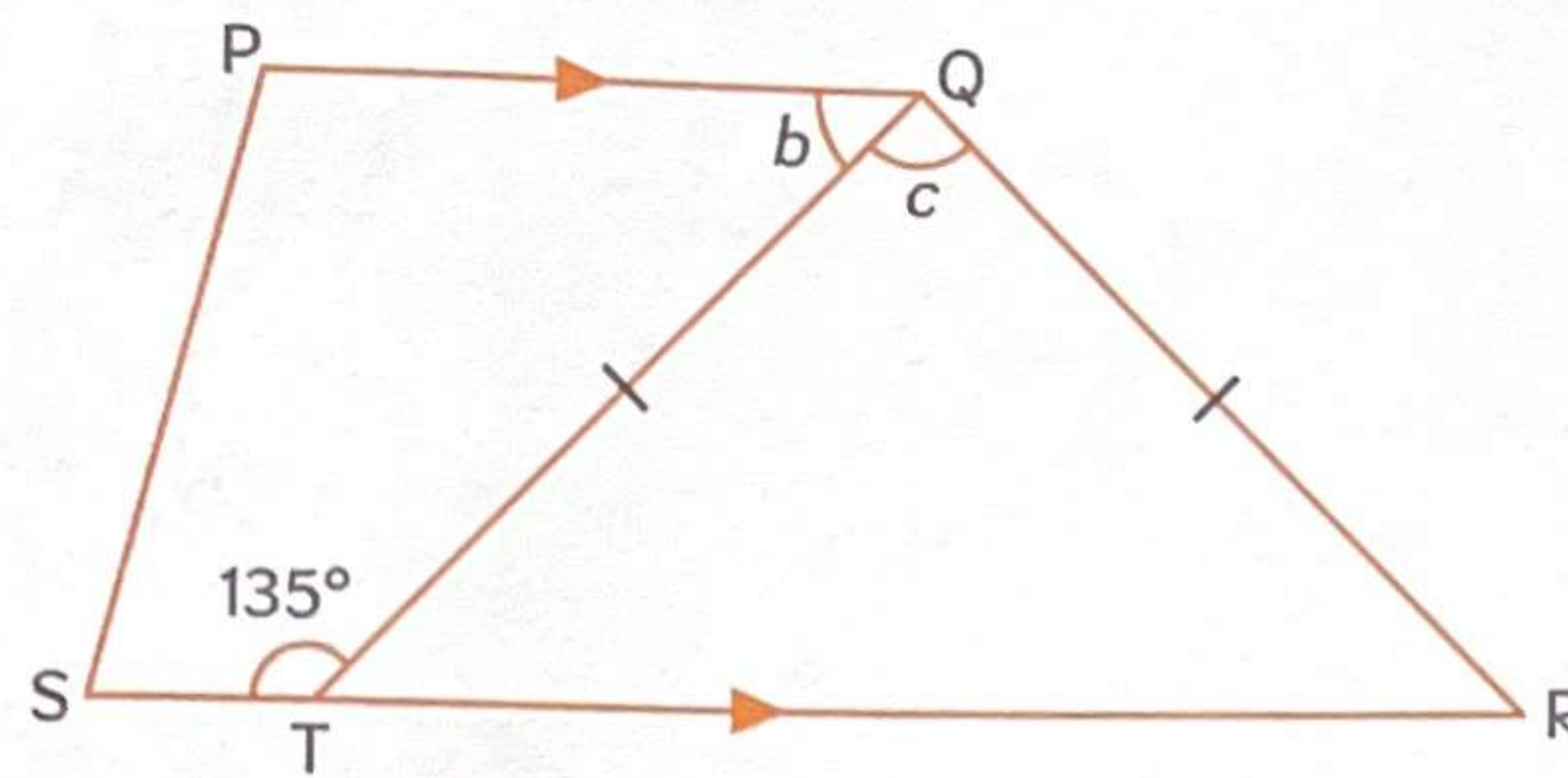




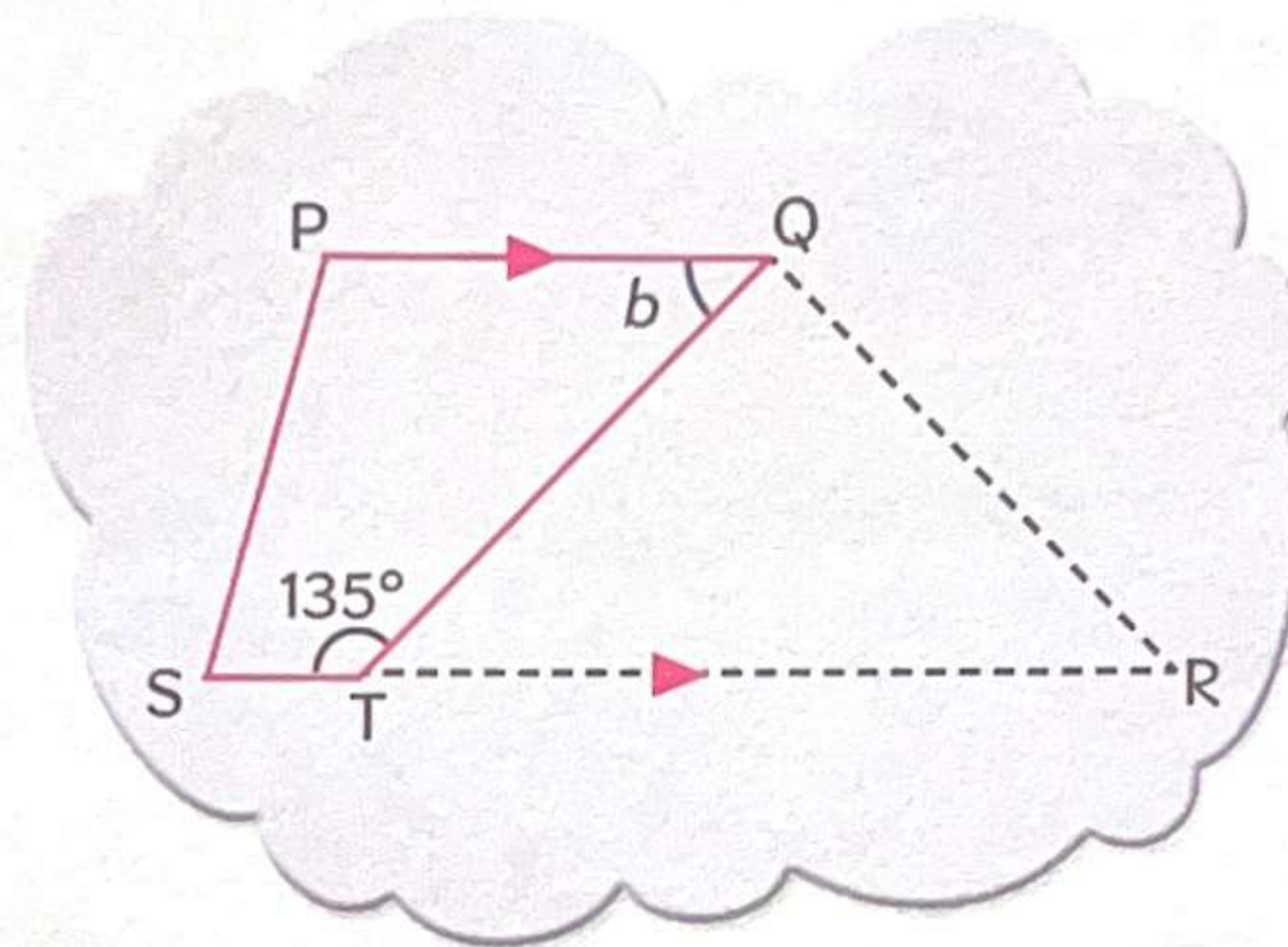
PQRS is a trapezium.

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

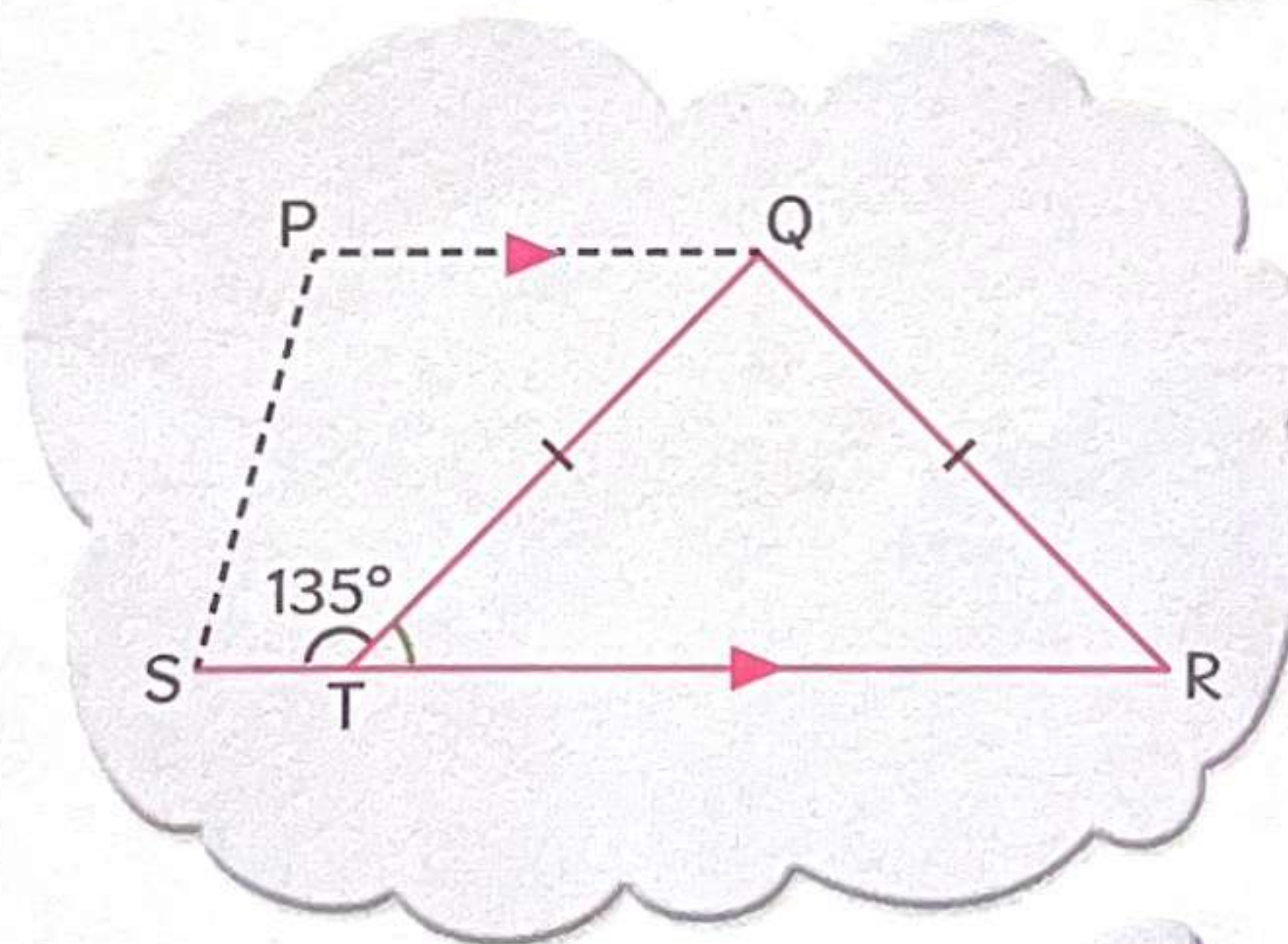
Find  $\angle b$  and  $\angle c$ .



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

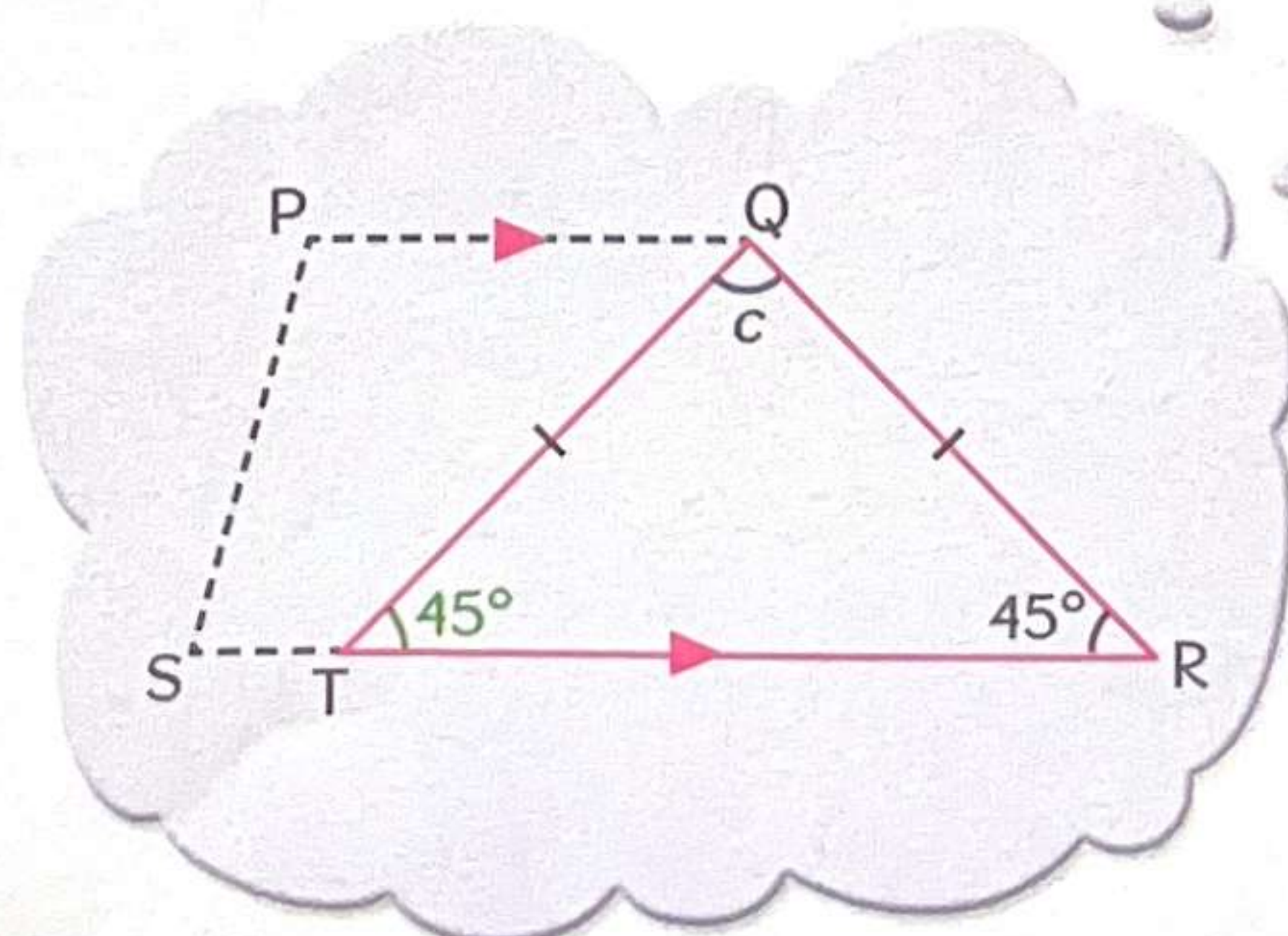


$$\begin{aligned}\angle QTR &= 180^\circ - 135^\circ \\ &= 45^\circ\end{aligned}$$



$$\angle QTR = \angle QRT$$

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



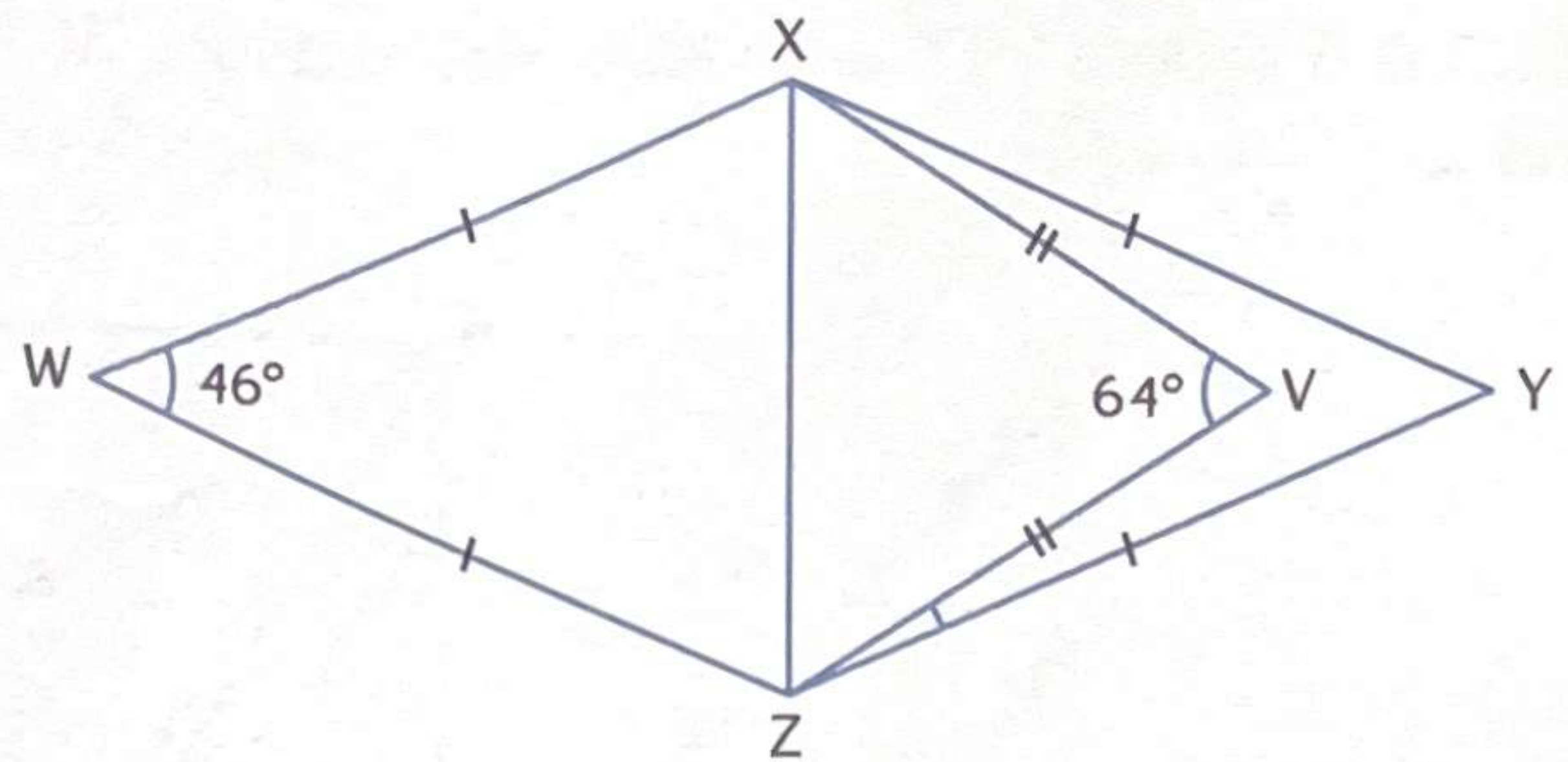


WXYZ is a rhombus.

XVZ is an isosceles triangle.

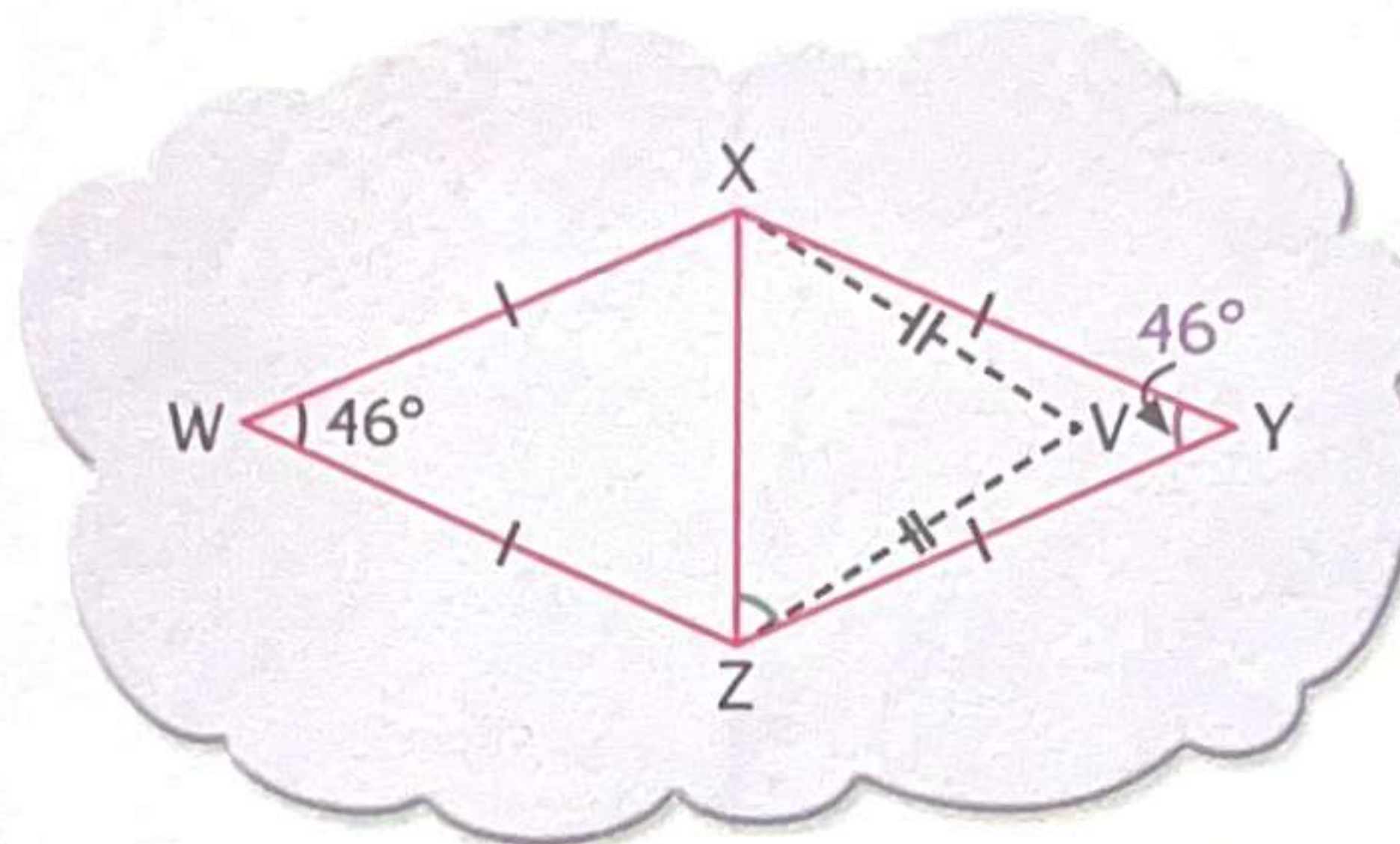
$\angle XWZ = 46^\circ$  and  $\angle XVZ = 64^\circ$ .

Find  $\angle VZY$ .

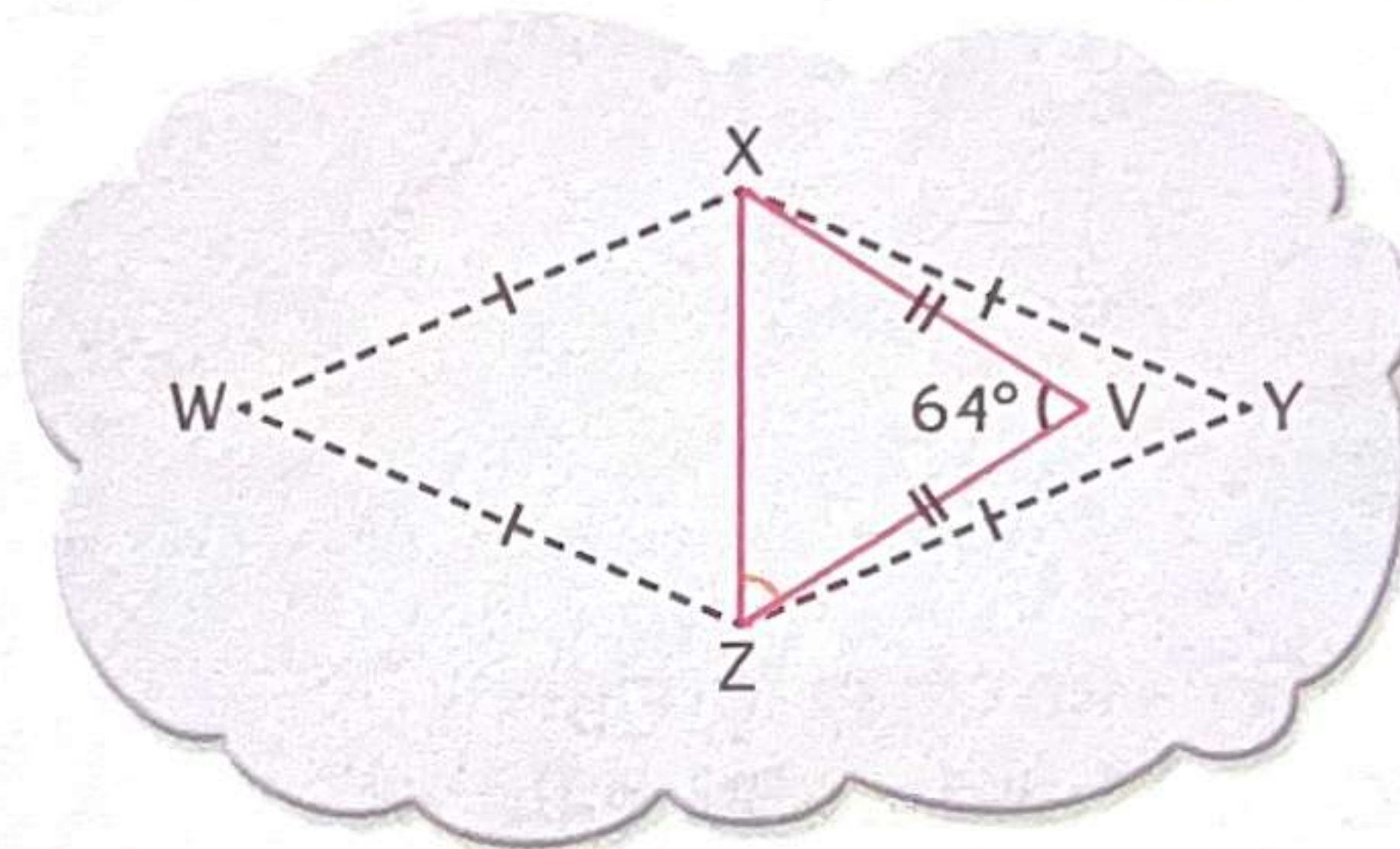


$$\angle XYZ = 46^\circ$$

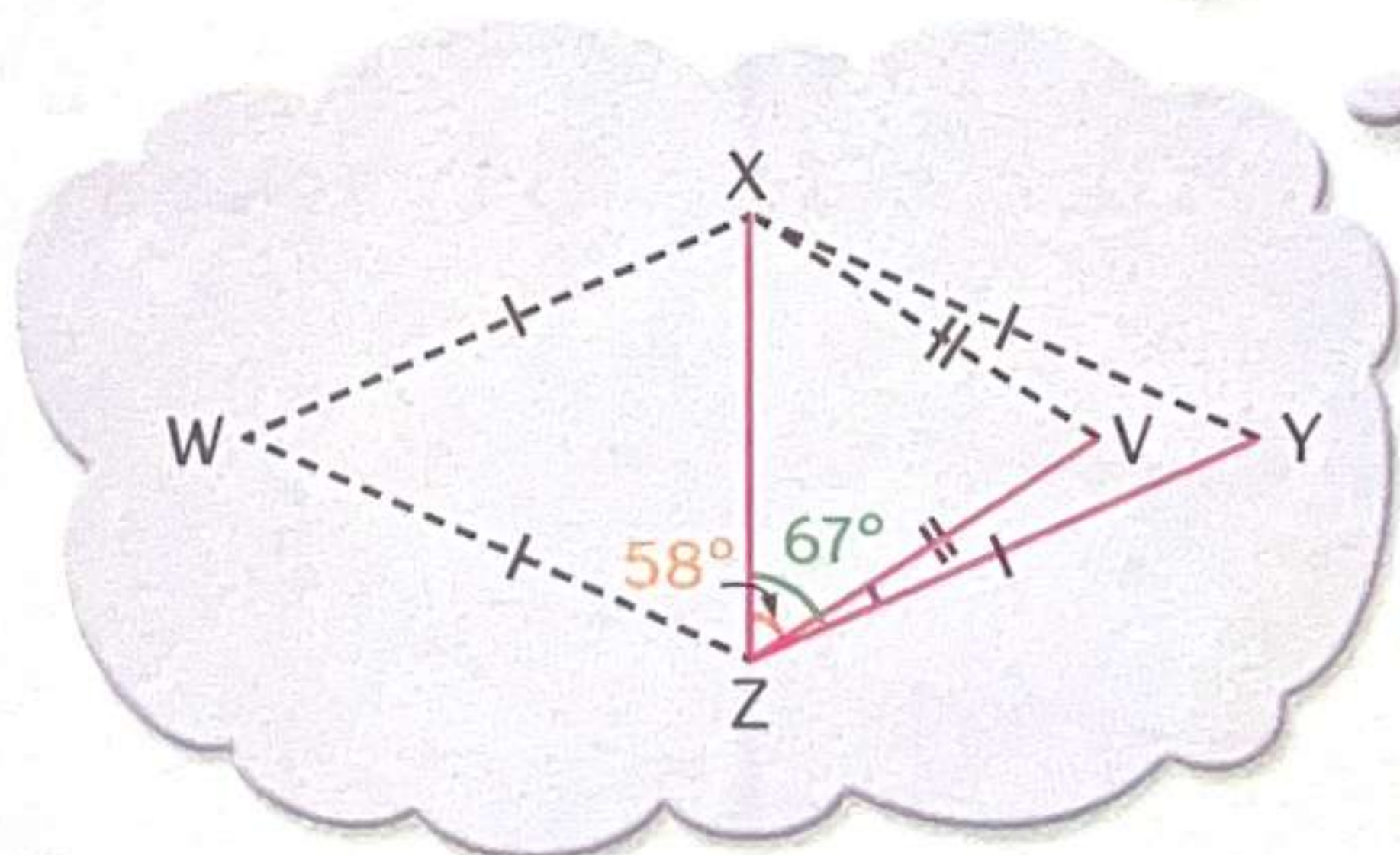
$$\begin{aligned}\angle XZY &= (180^\circ - 46^\circ) \div 2 \\ &= 67^\circ\end{aligned}$$



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



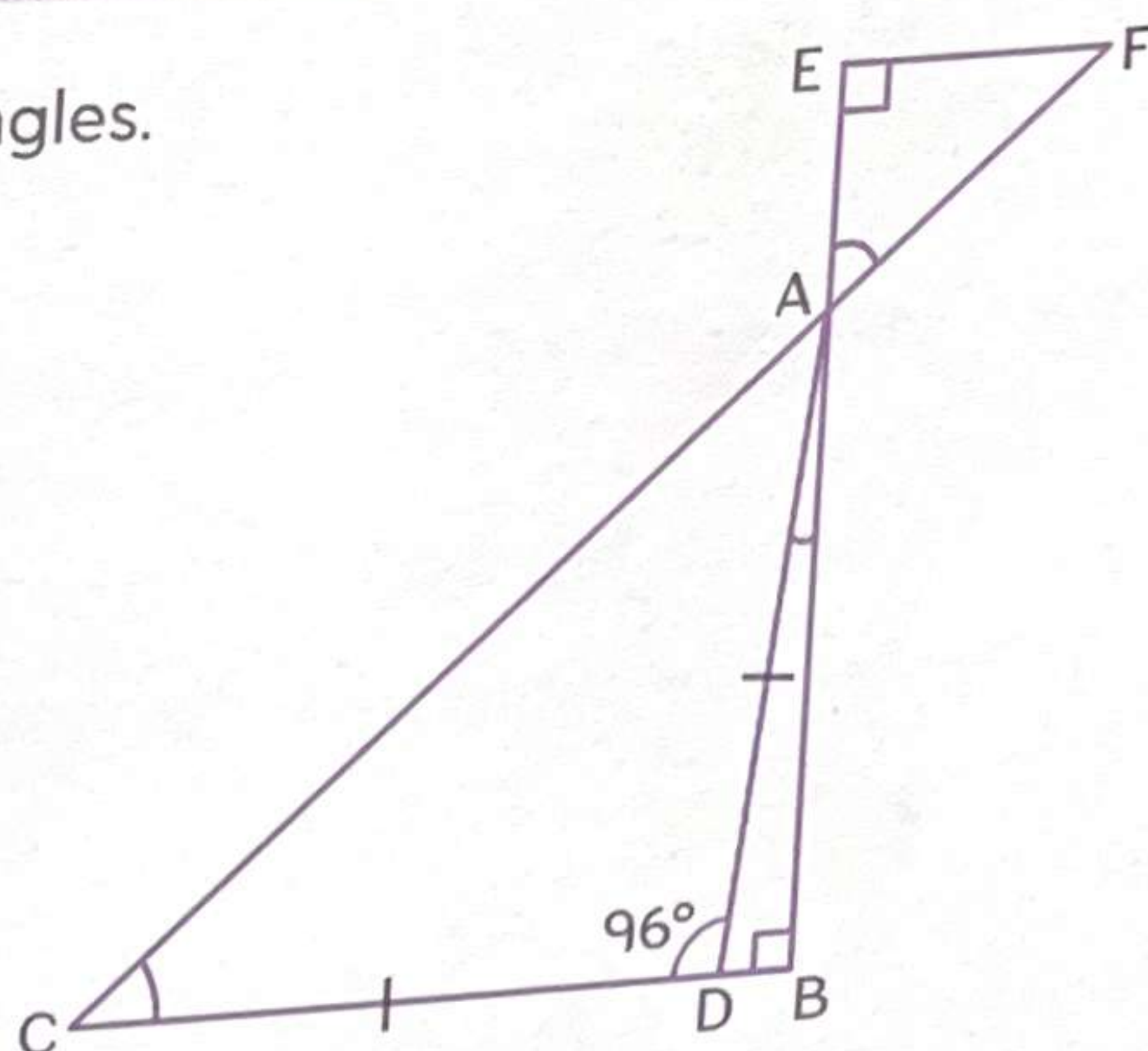
$$\begin{aligned}\angle VZY &= 67^\circ - 58^\circ \\ &= 9^\circ\end{aligned}$$





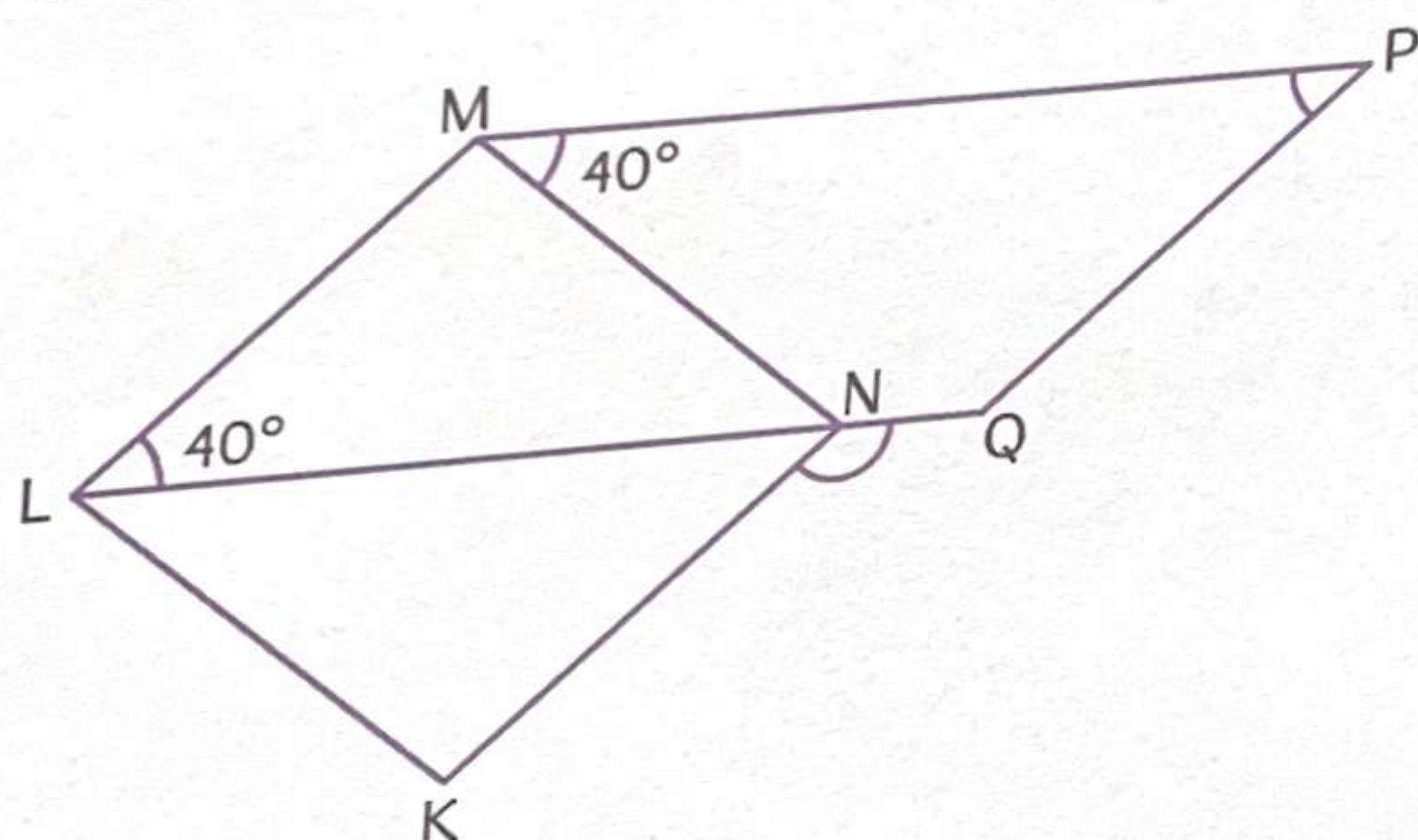
- (a) ABC and AEF are right-angled triangles.  
EB and CF are straight lines.  
ADC is an isosceles triangle.  
 $\angle ADC = 96^\circ$ .

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



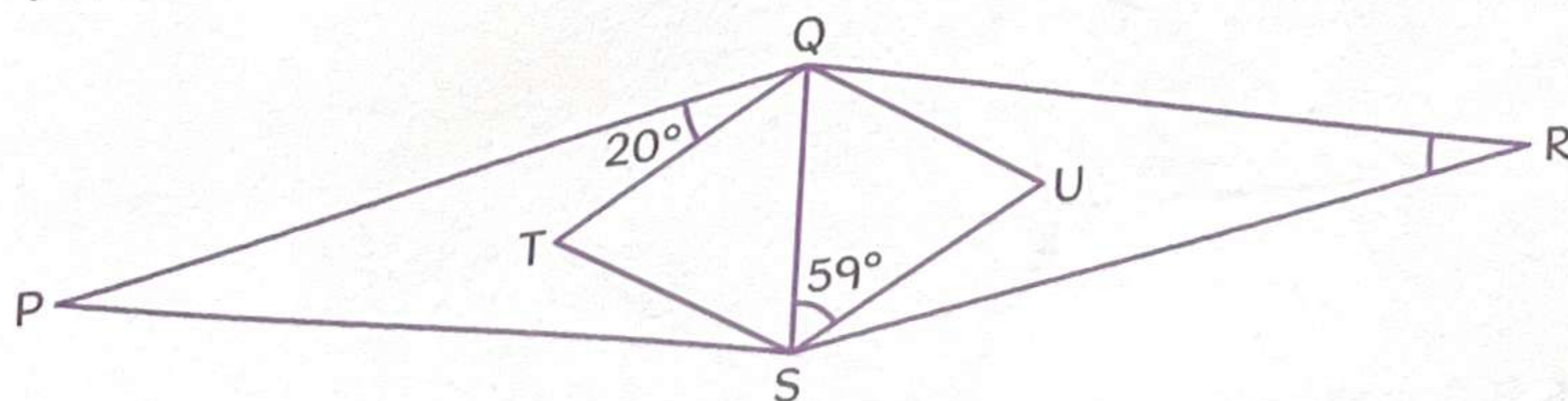
- (i)  $\angle ACD =$    
(ii)  $\angle DAB =$    
(iii)  $\angle FAE =$

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



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

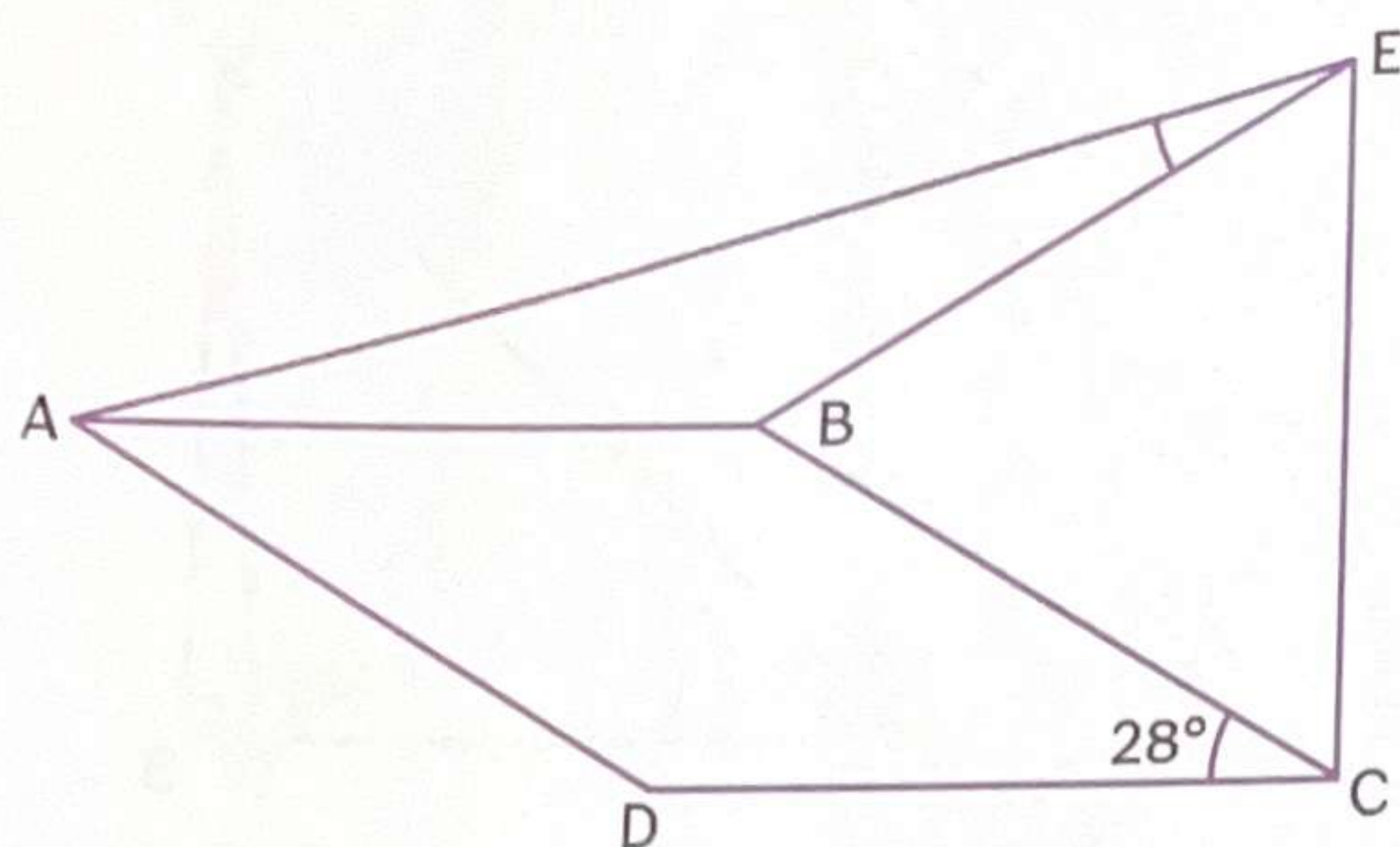
- (c) PQRS and TQUS are rhombuses.  $\angle PQT = 20^\circ$  and  $\angle QSU = 59^\circ$ .  
Find  $\angle QRS$ .



- $\angle QRS =$

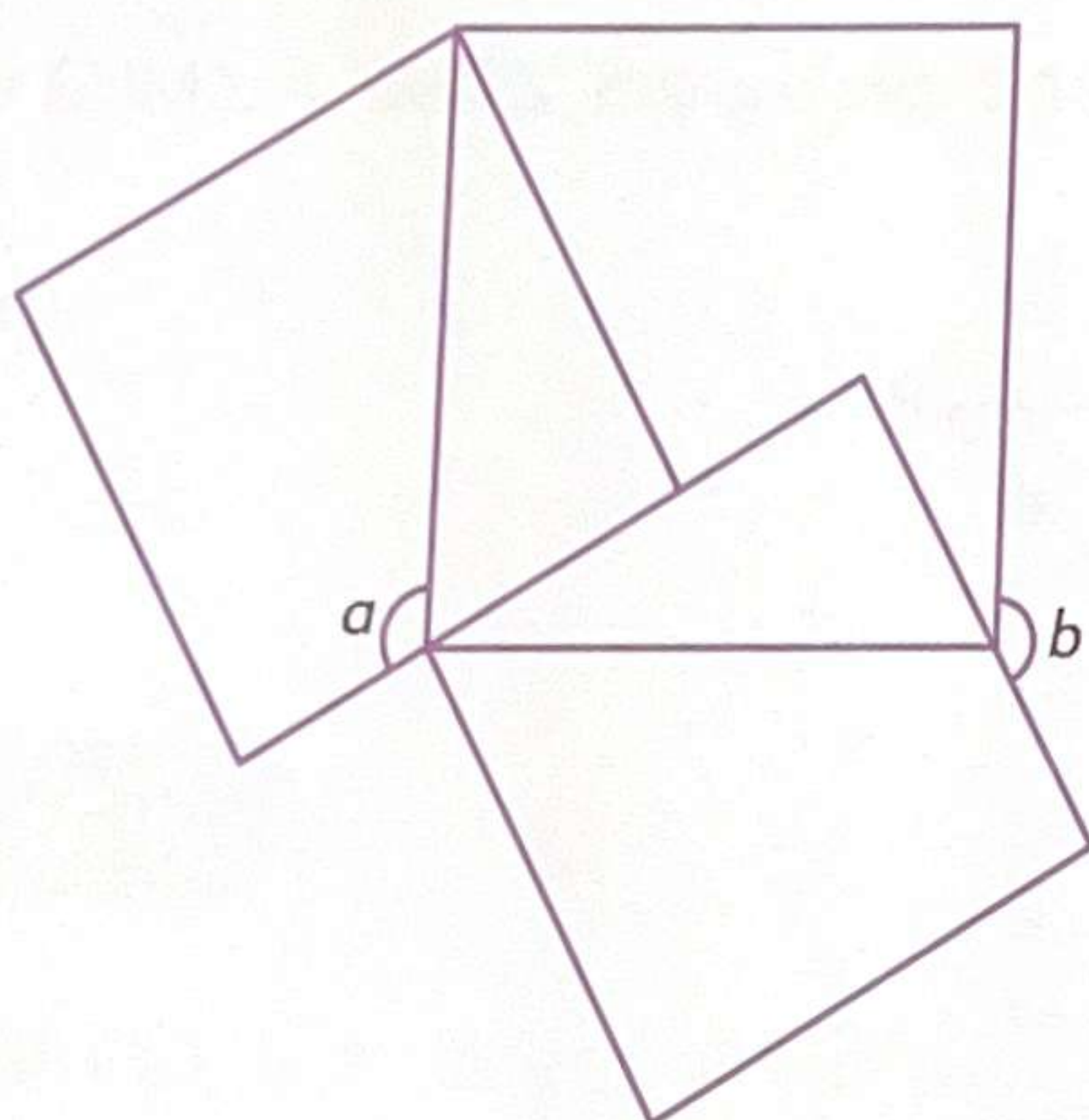


- (d) In the figure, ABCD is a rhombus and BEC is an equilateral triangle. Find  $\angle AEB$ .



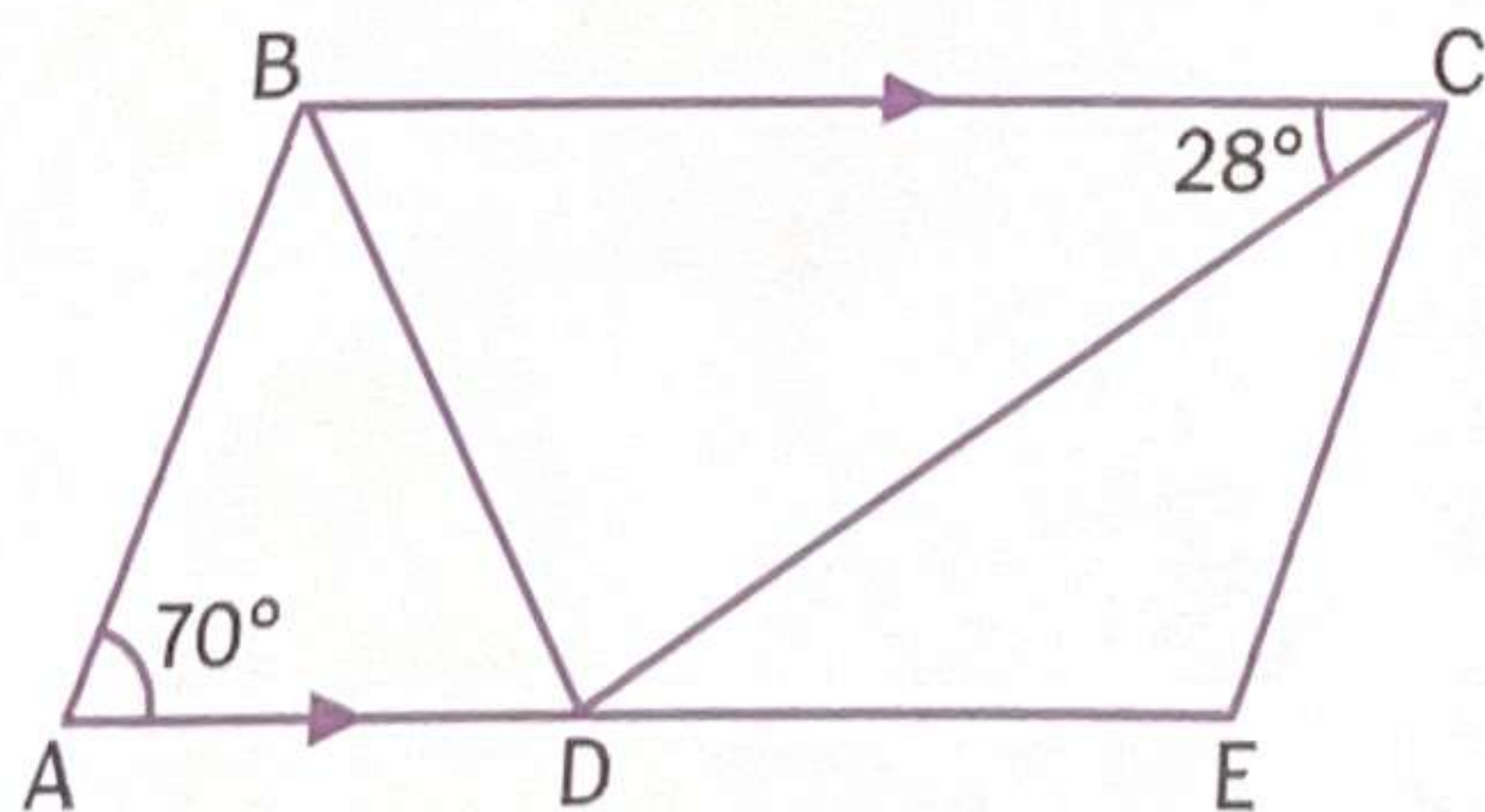
$\angle AEB =$

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



$\angle b =$

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



Is ABCE a parallelogram?  
Explain your answer.