

Proof organiser

Read the model proof, then write your own on page 2.



NAME _____ CLASS _____ DATE _____

LEARNING GOAL

Prove a fact about angles by writing statements, each with a reason.

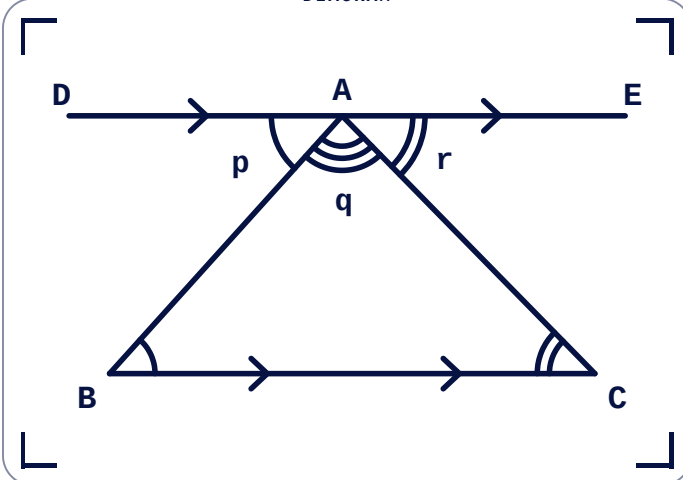
SUCCESS CRITERIA

- ☐ I can say what is given.
- ☐ I can give a reason for every statement.
- ☐ I can check my proof with numbers.

ENTRY **1** PROVE THAT

The angles in a triangle add up to 180° .

DIAGRAM



GIVEN DE is parallel to BC. p, q and r are the angles at A.
Matching arcs mark equal angles.

NO.	STATEMENT	REASON
1	angle DAB (p) = angle ABC	alternate angles are equal (parallel lines)
2	angle EAC (r) = angle ACB	alternate angles are equal (parallel lines)
3	angle DAB + angle BAC + angle EAC = 180° (p + q + r = 180°)	angles on a straight line add up to 180°
4	so angle ABC + angle BAC + angle ACB = 180°	substitute from 1 and 2 into 3

CONCLUSION

The angles in a triangle add up to 180° .

CHECK WITH NUMBERS

$$\begin{array}{c} \text{50} \\ \text{DEGREES} \end{array} + \begin{array}{c} \text{60} \\ \text{DEGREES} \end{array} + \begin{array}{c} \text{70} \\ \text{DEGREES} \end{array} = \begin{array}{c} \text{180} \\ \text{DEGREES} \end{array}$$

A check with numbers works for one triangle. The proof works for every triangle.

Now you prove it



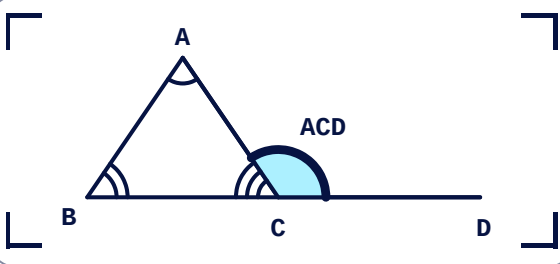
NAME _____ CLASS _____ DATE _____

ENTRY 2 PROVE THAT

The exterior angle of a triangle equals the sum of the two opposite interior angles.

▲ GIVEN BCD is a straight line.

DIAGRAM

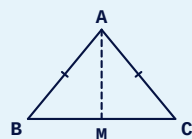


CHECK WITH NUMBERS

A = 50°, B = 60°. Work out:

ACB = ° ACD = °

GO FURTHER



Prove that the base angles of an isosceles triangle are equal.

Given: AB = AC. M is the midpoint of BC. Join A to M.

NO.	STATEMENT	REASON
1	angle ACB + angle ACD = °	
2	angle A + angle B + angle ACB = °	
3	so angle ACD = ° - angle ACB = angle + angle	

REASONS BANK

angles on a straight line add up to 180°

angles in a triangle add up to 180°

alternate angles are equal

given

subtract the same from both sides

NO.	STATEMENT	REASON
1		
2		
3		

Use as many rows as you need. Continue on the back.