

6 Problems involving shape and space

A Logic dictates...

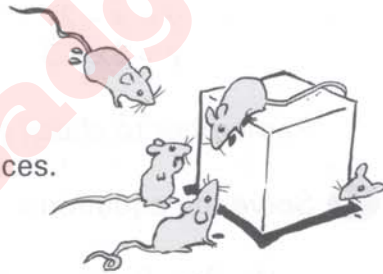
Each of the problems features two statements, **A** and **B**. You have to write statement **C**.

Beware: there are some problems where there isn't enough information to write statement C.

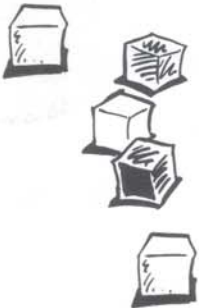
- 1 **A** Leonardo Da Vinci was born in 1452.
B He lived for 67 years.
C Therefore...

- 2 **A** All of Samuel Beckett's plays are extraordinary.
B 'All That Fall' is a play by Samuel Beckett.
C Therefore...

- 3 **A** All mice are grey.
B Midge is grey.
C Therefore...



- 4 **A** All cubes have 6 faces.
B Solid A is a cube.
C Therefore...



- 5 **A** All cubes have 6 faces.
B Solid B has 6 faces.
C Therefore...

- 6 **A** To be labelled a 'chocolate' bar, a bar must have at least 37% cocoa.
B An 'Inca-Bar' contains 35% chocolate.
C Therefore...

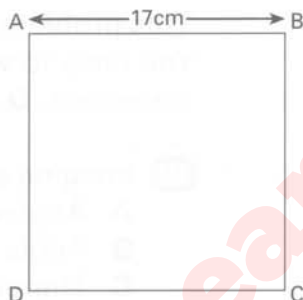


- 7 **A** $y = 17$.
B $x - y = 24$.
C Therefore...

- 8 **A** $x = 4.5$.
B $2x + z = 15$.
C Therefore...

- 9 **A** $x^2 = 64$.
B $y - 3x = -3$.
C Therefore...

- 10** **A** Shape ABCD is a square.
B The length of one side of the square is 17cm.
C Therefore...



- 11** **A** p is a multiple of 7.
B p is also a prime number.
C Therefore...

- 12** **A** Angle $s = 67^\circ$.
B Angles s and t are angles on a straight line.
C Therefore...

- 13** **A** Angles p and q are corresponding angles.
B Angle q is an acute angle.
C Therefore...

- 14** **A** Angle $u = 47^\circ$.
B Angle $v = 47^\circ$.
C Therefore...

- 15** **A** Angles r and s are the base angles of an isosceles triangle, RST.
B The third angle in the triangle, t , equals 68° .
C Therefore...

- 16** **A** Angle g is an interior angle of the triangle FGH.
B FGH is an equilateral triangle.
C Therefore...

- 17** **A** Shape PQRS is a quadrilateral.
B Two of the interior angles in PQRS are right angles.
C Therefore...

- 18** **A** Shape KLMN is a quadrilateral.
B Angles k and m are both 87° .
C Therefore...



Hussein



Ki

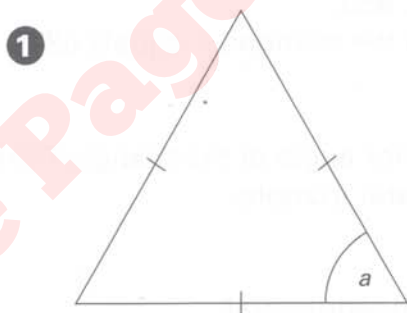
This problem features two statements, **A** and **B**.
You have to write statement **C** and then a fourth statement, **D**.

- 19** Imagine an isosceles triangle with angles a , b and c .
- A** Angles a and b are the base angles of the triangle.
 - B** Angle $a = 44^\circ$.
 - C** Therefore...
 - D** And therefore...

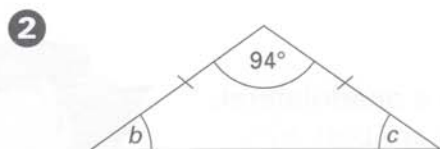
This problem features three statements, **A**, **B** and **C**.
You have to write statement **D** and then statement **E**.

- 20** **A** Angle $x = 83^\circ$.
B Angles y and z are angles on a straight line.
C Angles x and y correspond.
D Therefore...
E And therefore...

B Geometric reasoning problem bank

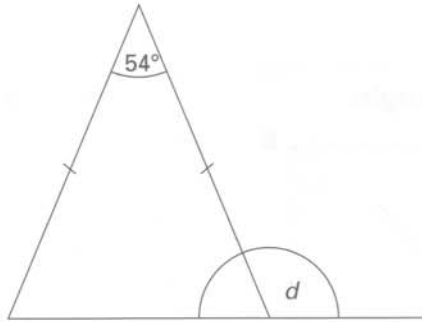


Explain why angle a must be 60° .



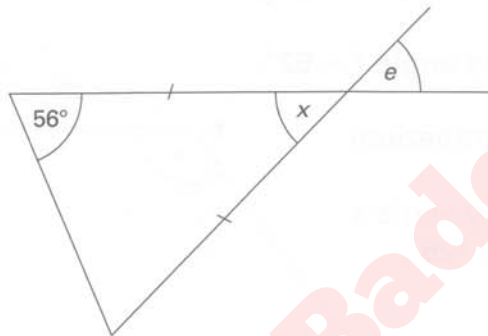
Explain why angle b must equal 43° .

3



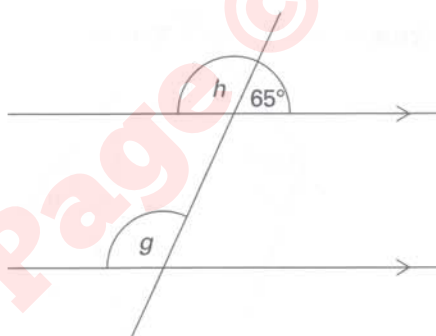
Explain why angle d must equal 117° .

4



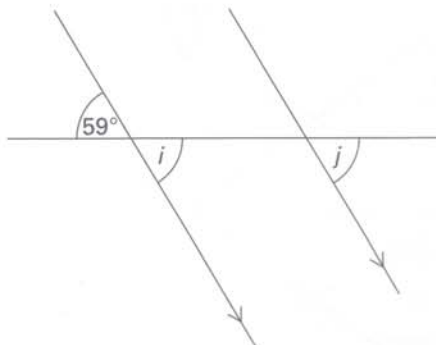
Show that angle $e = 68^\circ$.

5



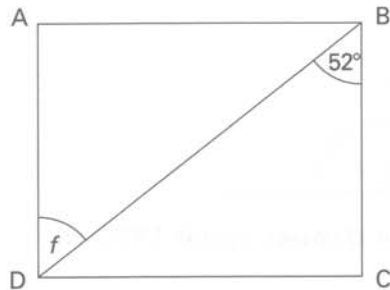
Show that angle $g = 115^\circ$.

6



Show that angle $j = 59^\circ$.

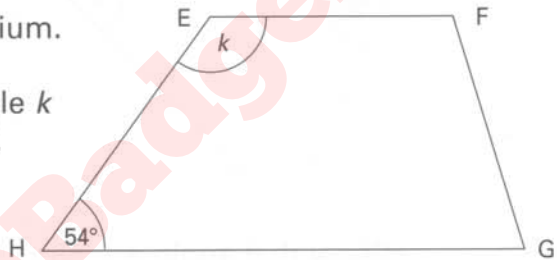
- 7 ABCD is a rectangle.



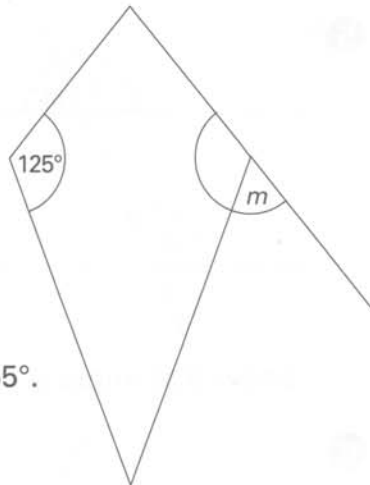
Explain why angle $f = 52^\circ$.

- 8 EFGH is a trapezium.

Explain why angle k must equal 126° .

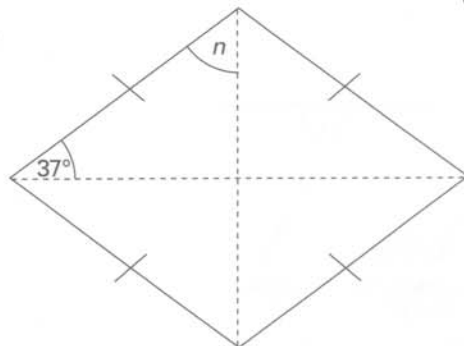


- 9 This shape is a kite.



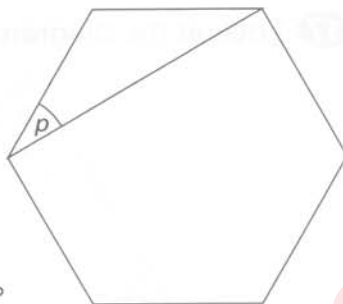
Show that angle $m = 55^\circ$.

- 10



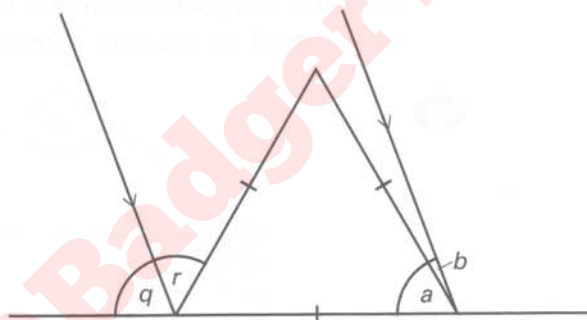
Show that angle $n = 53^\circ$.

- 11** This shape is a regular hexagon.



Show that angle $p = 30^\circ$.

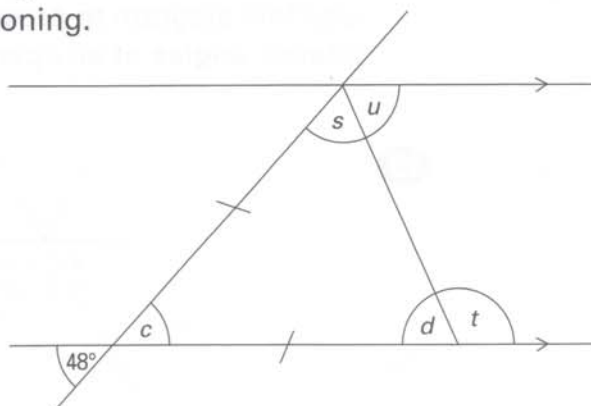
This diagram shows two parallel lines and an equilateral triangle.



Angle $b = 18^\circ$.

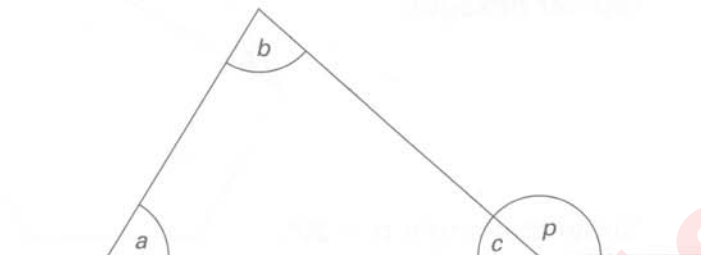
- 12** Find the value of angle q .
Show all your reasoning.
- 13** Find the value of angle r .
Show all your reasoning.

This diagram shows two parallel lines and an isosceles triangle.



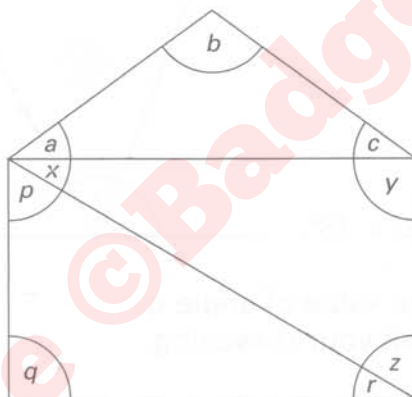
- 14** Calculate the size of angle s .
Show all your reasoning.
- 15** Find angle t .
Yes. Show all your reasoning.
- 16** Show that angle $u =$ angle s .

- 17** Look at the diagram.



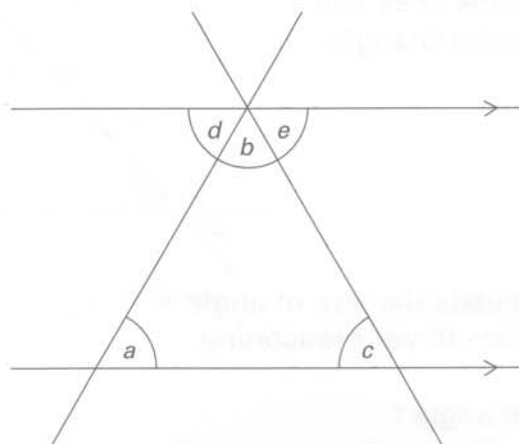
Use the diagram to prove that the exterior angle, p , is equal to the two interior angles a and b .

- 18**



Use this diagram to prove that the sum of the interior angles of any pentagon is 540° .

- 19**



Prove that the angles of a triangle sum to 180° .