

True, False, and 'Iffy' Shape Statements

Some of the statements on the next page are **Definitely true**; others are **Definitely false**; and some are **'Iffy'**. An **'Iffy'** statement is one that is not true as it stands, but which could become true if we made it more precise. For example, the statement

The diagonal of a rectangle is a line of symmetry.

is **'Iffy'**, because it is false for most rectangles (such as long thin rectangles), and is only true if the rectangle happens to be a square.

- 1 Cut out the statements **A–P** on the next page so that you have each statement on a separate piece of paper.
- 2 Make a table with four columns headed like this:

Definitely true	'Iffy'	Definitely false	Don't know

The **Definitely true** column should be about half a page wide. The other columns should be about one sixth of a page wide.

- 3 Pick one of the statements **A–P**.

Decide which column it should go in and put it there. Only use the **Don't know** column if you do not understand the statement, or if you cannot decide where it should go. (Remember: **'Iffy'** is not the same as **'Don't know'**.)

Repeat this for each of the statements **A–P**.

4 Now pick one of the statements you put in the ‘**Iffy**’ column.

Try to make your statement more precise so that your improved version could go in the **Definitely true** column.

For example, to make the statement

The diagonal of a rectangle is a line of symmetry.

more precise so that it becomes **Definitely true**, we could change it to

The diagonal of a *square* is a line of symmetry.

or

If the diagonal of a rectangle is a line of symmetry, then the rectangle must be a square.

Do this for each statement you put in the ‘**Iffy**’ column.

5 Ask me about any statements in your ‘**Don’t know**’ column.

- A** All squares are rectangles.
- B** A triangle can have two obtuse angles.
- C** The diagonals of a rectangle cross at right angles.
- D** If A is 20 cm from B and B is 10 cm from C , then A is 30 cm from C .
- E** When you double the sides of a square you double the area.
- F** A parallelogram has rotation symmetry of order 4.
- G** Cutting a kite along a diagonal produces two identical triangles.
- H** A parallelogram is a rectangle.
- I** Doubling the radius of a circle doubles its area.
- J** The longest side of a triangle is shorter than the sum of the lengths of the other two sides.
- K** If two rectangles both have area 24 cm^2 , they must also have the same perimeter.
- L** A rhombus is a parallelogram.
- M** Four straight lines cross at six different points.
- N** If two lines are perpendicular to a third line, they must be parallel to each other.
- O** Any parallelogram can be cut into two pieces which fit together to make a rectangle.
- P** Every quadrilateral can be used to tessellate the plane.