



## Evaluating mathematical statements

### Always, sometimes or never true?

|   |   |
|---|---|
| $a \times b = b \times a$<br>It doesn't matter which way round you multiply, you get the same answer. | $a \div b = b \div a$<br>It doesn't matter which way round you divide, you get the same answer. |
| $12 + a > 12$<br>If you add a number to 12, you get a number greater than 12.                         | $12 \div a < 12$<br>If you divide 12 by a number, the answer will be less than 12.              |
| $\sqrt{a} < a$<br>The square root of a number is less than the number.                                | $a^2 > a$<br>The square of a number is greater than the number.                                 |

### Always, sometimes or never true?

When you cut a piece of a shape, you reduce its area and perimeter.

What happens to the area and perimeter with these cuts?

**A**

**What happens to the area and perimeter with these cuts?**

The diagrams show three examples of cutting a shape:

- A circle is cut into a sector. The area of the sector is less than the area of the original circle, but the perimeter of the sector (including the arc) is greater than the perimeter of the original circle.
- A triangle is cut into a smaller triangle with a semi-circular notch. The area of the resulting shape is less than the area of the original triangle, and its perimeter is also less than the original triangle's perimeter.
- A square is cut into an L-shaped polygon. The area of the L-shape is less than the area of the original square, but its perimeter is greater than the original square's perimeter.



**True, false or unsure?**

|   |  |
|---|--|
| When you roll a fair six-sided die, it is harder to roll a six than a four.                                       | Scoring a total of three with two dice is twice as likely as scoring a total of two.               |
| In a lottery, the six numbers 3, 12, 26, 37, 38, 40 are more likely to come up than the numbers 1, 2, 3, 4, 5, 6. | In a 'true or false' quiz with ten questions, you are certain to get five right if you just guess. |
| If a family has already got four boys, then the next baby is more likely to be a girl than a boy.                 | The probability of getting exactly three heads in six coin tosses is $\frac{1}{2}$ .               |