

Statement 1

The object is a cube

 $\Rightarrow$ **Statement 2**

The object has six faces

If an object is a cube that implies it has six faces. The opposite is not necessarily true. If an object has six faces, it could be both a cube as well as a cuboid. Not just a cube.

Statement 1

$x = 29$

Statement 2

$x > 11$

If x is 29 it definitely is greater than 11 so statement 1 implies statement 2. However, statement 2 does not imply statement 1 as x being greater than 11 could be so many values and not just 29.

Statement 1

$x^3 = x$

Statement 2

$x = -1$

$$x^3 - x = 0$$

$$x(x^2 - 1) = 0$$

$$x(x+1)(x-1) = 0$$

$$\text{so } x = 0$$

$$x = 1$$

$$x = -1$$

Thus the value of x could be 0, -1 and +1, not just -1, so statement 1 does not imply statement 2. However, if we start with $x = -1$ and then cube x , so $(-1)^3$ would equal x . So statement 2 implies statement 1.

Examples of Logical Equivalence