Had a look ☐ Nearly there ☐ Nailed it! ☐

A* A B C D

Inequalities on graphs

You can show the points that satisfy inequalities involving x and y on a graph.

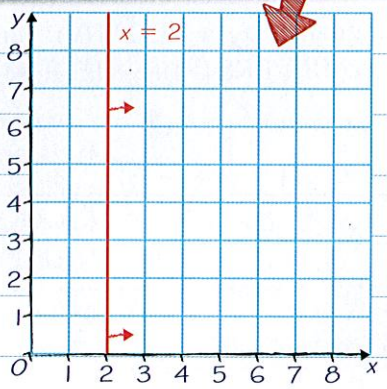
For example, follow these steps to shade the region R that satisfies the inequalities:

$x \geqslant 2$ $y > x$ $x + y \geqslant 6$

Always work on one inequality at a time.

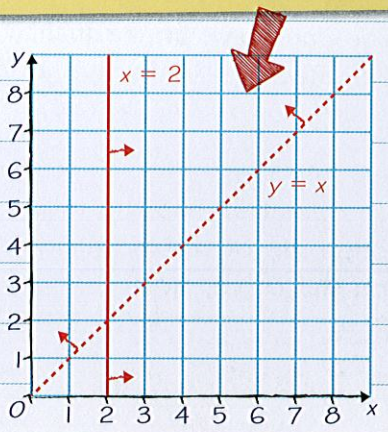
1 $x \geqslant 2$

Draw the graph of $x = 2$ with a solid line.
Use a small arrow to show which side of the line you want.



2 $y > x$

Draw the graph of $y = x$ with a dotted line.
Show which side of the line you want.

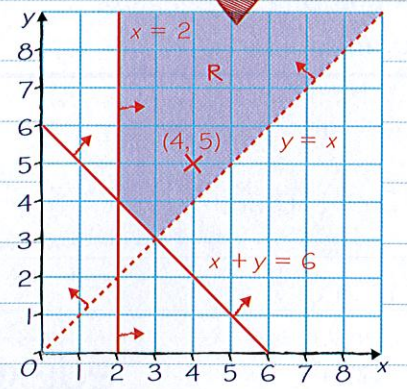


3 $x + y \geqslant 6$

Draw the graph of $x + y = 6$ with a solid line. Use a table of values.

x	0	3	6
y	6	3	0

Show which side of the line you want.
$x + y$ increases as you move away from the origin.
Shade in the region and label it R.



4 Check it!

Pick a point inside your shaded region.
Check that the x- and y-values for that point satisfy **all** the inequalities.
At (4, 5) $x = 4$ and $y = 5$.
$x \geqslant 2$ ✓
$y > x$ ✓
$x + y \geqslant 6$ ✓

Graphical inequalities checklist

- $<$ and $>$ are shown by DOTTED lines. ✓
- $\leqslant$ and $\geqslant$ are shown by SOLID lines. ✓
- Points on a solid line ARE included in the region. ✓
- Points on a dotted line AREN'T included in the region. ✓

Now try this

edexcel

On a grid with $-5 \leqslant x \leqslant 5$ and $-2 \leqslant y \leqslant 5$, mark with a cross (×) each of the six points which satisfy all of these three inequalities where x and y are both integers.

$x \geqslant -2$ $y \geqslant 1$ $x + y < 2$ **(4 marks)**

grade A