

## It pleases the court

### Inequalities

- GARETH                      So would you mind going through the main argument in your client's defence?
- MARIA                        My client could not have been at home at noon on the day in question. Let's start with the facts.
- THOMAS                     Objection!
- JUDGE                        Overruled, go home counsel!
- MARIA                        My client processes 2 units per hour. She began her shift at 8am, at which time there were 25 unprocessed units. She was processing both those units and the units that came back from maintenance. When she finished her shift, there were 11 unprocessed units.
- GARETH                     Here's where some of the jurors needed clarification, but I think that I've worked it out.
- Start with 25 units. Pack up to 2 per hour, which reduces the amount left. We don't know how many units came back from maintenance but the total must have been reduced to less than 11.
- Anything involving 'less than' or 'greater than' is what mathematicians call an inequality.
- THOMAS                     Objection! Inequality is a cause of many problems in society.
- JUDGE                        Overruled.
- GARETH                     Yes, let's get back to this mathematical inequality. Subtract 25 from both sides. Notice that the negative belongs to the  $2h$ .
- Now watch carefully; we need to divide by negative 2. This will reverse the inequality.
- The jury wanted evidence for that last step didn't they?
- MARIA                        They certainly did. We had  $-2h$  being less than  $-14$ . We could add  $2h$  to both sides and add 14 to both sides. Now

divide by 2 to get...  $[7 < h]$ . This statement says that 7 is less than  $h$ . Our previous solution says that  $h$  is greater than 7.

GARETH

These two statements say the same thing!

MARIA

Exactly. So as we can see on this timeline, my client must have finished work over seven hours after she started – in other words, after 3pm.

THOMAS

Objection! Bamboozling the witness.

MARIA

There is no witness right now! The judge dismissed the case due to maths. Maths bring about true justice!