Mathematics

Manipulating equations and inequalities

Mr Millar

Connect

If we know that $2x + 3y > 15$, are the following sometimes, always or never true?

$4x + 6y > 30$

$2x > 14 - 3y$

$2x + 6y > 15$

Independent task

1. Given that $x - 6 = y$, fill in the gaps to make each of these equations hold.

$\_\_\_x - 18 = 3y$	$x - \_\_\_ = y - 3$	$3x - 6 = y + \_\_\_$

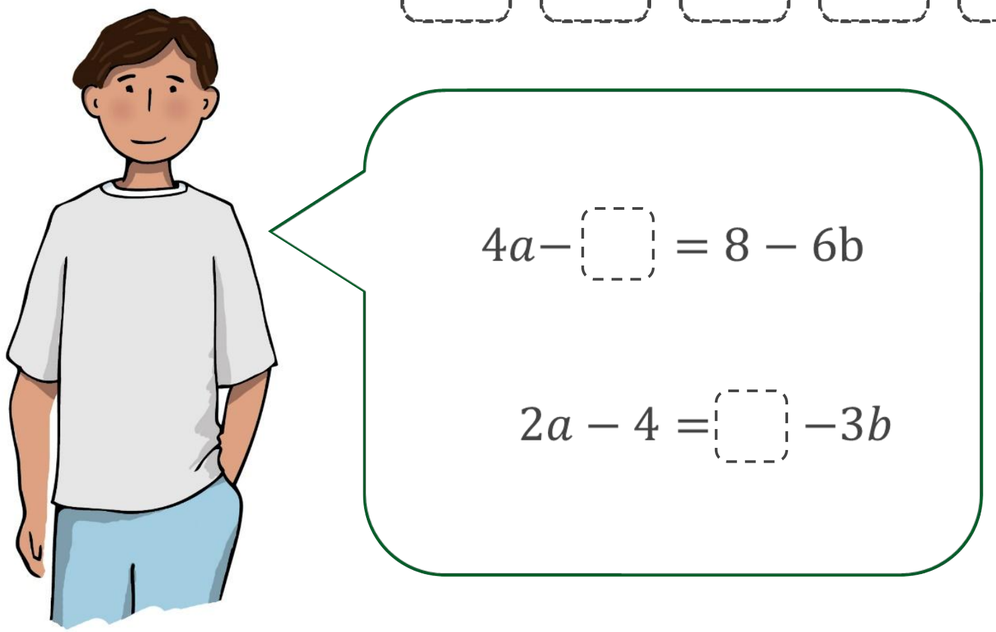
2. Given that $x - 6 = y$, which of the following inequalities are always true?

$x - 6 < y + 1$	$x - 4 < y$	$2(x - 6) > y$

Explore

Antoni has written a pair of statements that are true at the same time. How many ways can you complete it using the number cards?

1	2	3	4	5	6	7	8	9



Answers

Connect

If we know that $2x + 3y > 15$, are the following sometimes, always or never true?

$4x + 6y > 30$

Always true since x2 to both sides to maintain the inequality

$2x > 14 - 3y$

Always true since -3 to both sides gives $2x > 15-3y$ which will be always true

$2x + 6y > 15$

Sometimes true if y is negative it might be false.

Independent task

1. Given that $x - 6 = y$, fill in the gaps to make each of these equations hold.

$3x - 18 = 3y$

$x - 9 = y - 3$

$3x - 6 = y + 2x$

2. Given that $x - 6 = y$, which of the following inequalities are always true?

$x - 6 < y + 1$

Always true

$x - 4 < y$

Never true

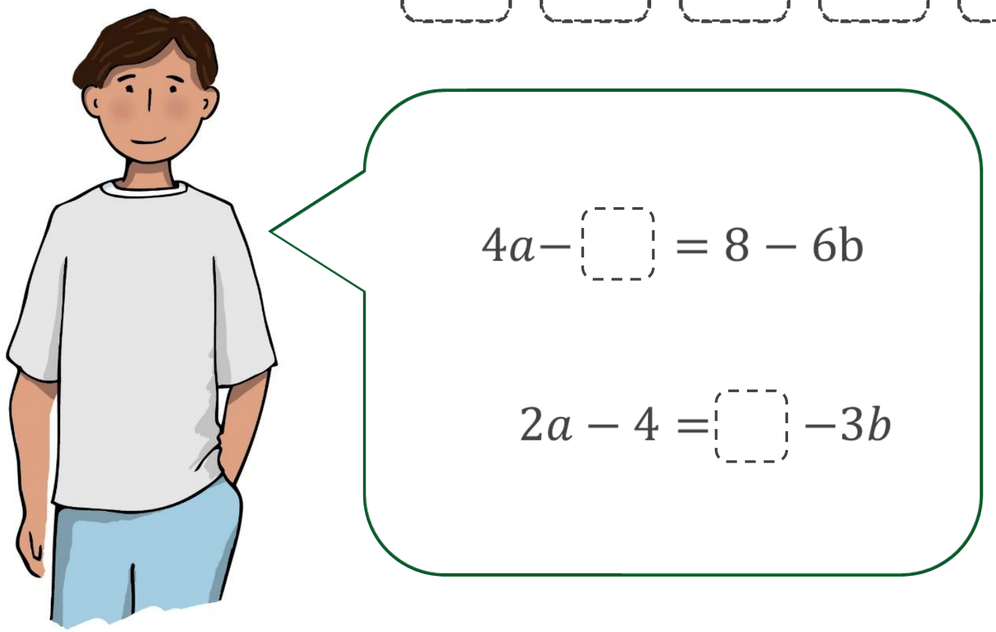
$2(x - 6) > y$

Sometimes true

Explore

Antoni has written a pair of statements that are true at the same time. How many ways can you complete it using the number cards?

1	2	3	4	5	6	7	8	9



We can immediately see that if the top box is 8 and bottom is 4, the top is equation is double the other.

But if we rearrange both equations to get

4a = 8 + ___ - 6b

2a = 4 + ___ - 3b

We see other possibilities where the top can be double the bottom, eg 2 and 1, 4 and 2, 6 and 3.