Changing the subject of a formula is very similar to solving an equation. Making x the subject means rearranging the formula so that x is on its own on the left-hand side.

Example: Make x the subject of the following formula.

$$c = \frac{x}{5} - 1$$

+1 to both sides

$$c + 1 = \frac{x}{5}$$

x5 to both sides

$$5(c + 1) = x$$

ACTIVITY 1

Rearrange the following formula to make x the subject.

1.
$$b = 2x + 2$$

2.
$$a = \sqrt{x + 4}$$

3.
$$c = \frac{(x + 2)a}{3}$$

4.
$$t = \frac{3x}{2}$$

5.
$$y = \sqrt{x - 4}$$

Algebra
Solving Inequalities

Solving an inequality is very similar to solving an equation.
You need to get the variable on its own on one side of the inequality.
To do this, deal with the lowest amount of the variable.

Example:

$$5 - 2x < 15$$

-5 from both sides

$$-2x < 10$$

÷ -2 on both sides, sign is reversed

$$x > -5$$

REMEMBER
Multiplying or Dividing by a negative number reverses the sign

ACTIVITY 1

Solve the following inequalities.

1.
$$4x - 7 > 2 - 2x$$

2.
$$7x - 2 > 2x - 7$$

3.
$$5x + 2 \geq 2x + 11$$

4.
$$3x + 2 \geq x + 10$$

5.
$$3x + 10 \leq x + 6$$

Explore LEARNING

ACTIVITY 3

Use the skills that you've been practicing to discover an algebraic formula for the following word problems and then find solve them!

1. Every morning befor work, Mr Smith selects a shirt.
His choice of shirt colour and the probability of the colour being chosen are in the table.

Shirt colour	White	Blue	Grey	Pink
Probability	0.45	0.19	$2x$	x

Form an equation and find the value of x.

Probability

If you add each of the probablities together, they must add to 1.

Knowing this, can you write an equation using x and the facts you are given in the question to find the value of x?

2. Ash is x years old.
His brother is 2 years younger than him.
His sister is 8 years older than him.
The mean of their ages is 12.

Form an equation and find the value of x.

Finding the mean

To find the mean, you must add all of the terms together then divide by the number of terms you have.

Knowing this, can you write an equation using x and the facts you are given in the question to find the value of x?