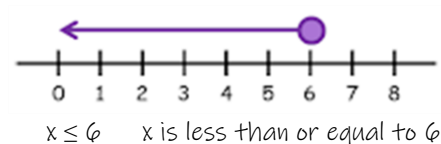
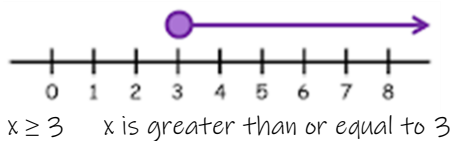
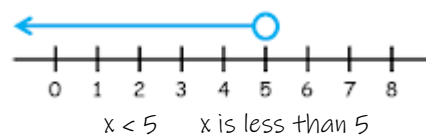
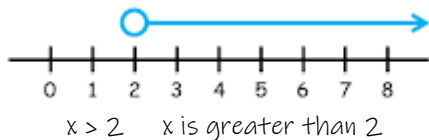


## Y9 Maths Knowledge Organiser Topic 8: Inequalities

<b>What must I be able to do?</b> You may need to revise the following: <ul style="list-style-type: none"> <li><a href="#">Year 8 Topic 8: Negative Numbers 2</a></li> </ul> <b>New content:</b> <ul style="list-style-type: none"> <li>Show and read inequalities on a number line.             <ul style="list-style-type: none"> <li><a href="#">Sparx M384</a></li> </ul> </li> <li>Solve linear inequalities             <ul style="list-style-type: none"> <li><a href="#">Sparx M118, M732</a></li> </ul> </li> </ul>	<b>Key vocabulary</b> <table> <tr> <td><b>Inequality</b></td><td>An inequality <u>compares two</u> numbers or algebraic expressions, showing if one is <u>greater than</u>, greater than or equal to, less than, or <u>less than</u> or equal to another value.</td></tr> <tr> <td><b>Inclusive</b></td><td><u>Including</u> the last number</td></tr> <tr> <td><b>Exclusive</b></td><td><u>Not including</u> the last number</td></tr> <tr> <td><b>Satisfy</b></td><td>To <u>fulfill</u> the <u>requirements</u>, or meet the conditions of something.</td></tr> </table>	<b>Inequality</b>	An inequality <u>compares two</u> numbers or algebraic expressions, showing if one is <u>greater than</u> , greater than or equal to, less than, or <u>less than</u> or equal to another value.	<b>Inclusive</b>	<u>Including</u> the last number	<b>Exclusive</b>	<u>Not including</u> the last number	<b>Satisfy</b>	To <u>fulfill</u> the <u>requirements</u> , or meet the conditions of something.
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### Representing Inequalities

- The key points of the inequality are represented by circles on the number line. We usually use a letter to represent the range of possible values e.g.  $x$
- An empty circle represents either  $a <$  or  $>$  (the value is not included)
- A filled in circle represents either  $a \leq$  or  $\geq$  (the value is included)
- The direction of the line/arrow decides whether it is less than or greater than



If  $x$  is between two values we can use 2 circles.

$1 < x \leq 6$        $x$  is greater than 1 but less than or equal to 6

### Solving Inequalities

Solving an inequality is generally the same method and steps as solving any other equation. The main difference is the equals sign has been replaced by an inequality sign.

The one difference in the method is if at any point there is a need to multiply or divide by a negative number then the direction of the inequality changes.

**Method 1**

e.g.  $-3y + 2 > 8$

$+3y$  (arrow down)

$2 > 8 + 3y$

$-8$  (arrow down)

$-6 > 3y$

$\div 3$  (arrow down)

$-2 > y$

**Method 2**

$-3y + 2 > 8$

$-2$  (arrow down)

$-3y > 6$

$\div -3$  (arrow down)

$y < -2$

Avoid dividing by the negative by doing the inverse of the  $-3y$  first and turn it into  $+3y$

These two answers are equivalent (the same)

As there is a division by a negative the inequality sign has changed direction