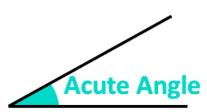
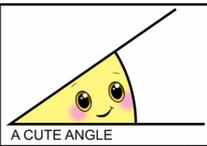
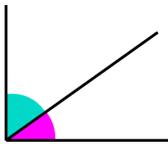


# Angles

Name	Rules				© mymathscloud
<p><b>Classifications</b></p> <p>Damn son its like 20 degrees outside</p>  <p>Sure looks like 90 degree weather today</p>  <p>Why is the obtuse triangle always upset? Because it is never right.</p> 	<p><b>Acute</b></p> <p>Less than 90°</p>  <p><b>Acute Angle</b></p>  <p>A CUTE ANGLE</p>	<p><b>Right</b></p> <p>Equal to 90°</p>  <p><b>Right Angle</b></p>  <p>How do you keep warm in a cold room? You go to the corner, because it's always 90 degrees.</p>	<p><b>Obtuse</b></p> <p>More than 90° but less than 180°</p>  <p><b>Obtuse Angle</b></p>   <p><b>Geometry Kitchh</b></p> <p>Demonstrates Obtuse Angle</p>	<p><b>Reflex</b></p> <p>More than 180° but less than 360°</p>  <p><b>Reflex Angle</b></p>  <p>reflex angle</p>	<p><b>Zero</b></p> <p>Equal to 0°</p> <hr/> <p><b>Straight</b></p> <p>Equal to 180°</p> <p><b>Straight Line Angle</b></p> <hr/> <p><b>Full</b></p> <p>Equal to 360°</p> <p><b>Full Rotation Angle</b></p> 

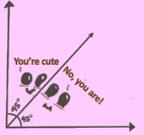
**Right Angles**



$\triangle + \triangle = 90^\circ$

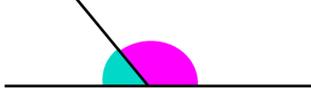
Angles in a right angle add to 90° and are called complementary

**Complementary Angles**  
Angles that compliment each other



You're cute  
No you are!

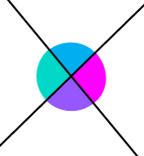
**Straight Line Angles**



$\triangle + \triangle = 180^\circ$

Angles on a straight line add to 180° and are called supplementary

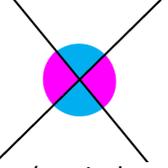
**Angles At A Point**



$\triangle + \triangle + \triangle + \triangle = 360^\circ$

Angles at a point add to 360°

**Vertical Angles**



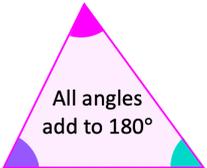
Opposite angles (vertical angles) are equal

$\triangle = \triangle$

$\triangle = \triangle$

**Triangles**

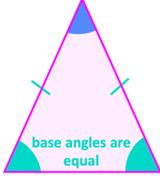
**Sum of angles in any triangle**



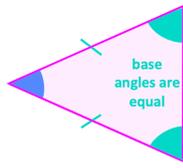
All angles add to 180°

$\triangle + \triangle + \triangle = 180^\circ$

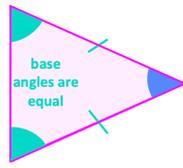
**Isosceles Triangle Angles**



base angles are equal



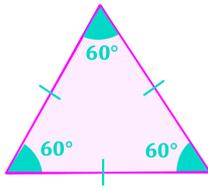
base angles are equal



base angles are equal

each  $\triangle = \frac{180 - \triangle}{2}$

**Equilateral Triangle Angles**

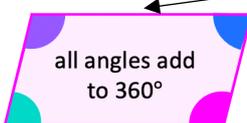


60° 60° 60°

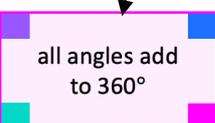
each  $\triangle = 60^\circ$

**Quadrilaterals**

$\triangle + \triangle + \triangle + \triangle = 360^\circ$



all angles add to 360°



all angles add to 360°



all angles add to 360°

**Isosceles Trapezium**

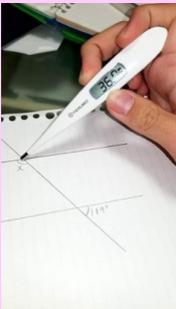


Base angles equal  
Upper angles equal

Parallelograms

<p><b>Adjacent Angles</b></p>	<p><b>Opposite Angles</b></p>
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Parallel lines Cut By A Transversal



**Parallel Lines Cut By A Transversal**

<p><b>Alternate Interior Angles:</b></p> <p>angles on <b>opposite sides</b> of the transversal and <b>inside</b> the path are equal</p> <p>This rule can be remembered by a Z shape (or a back to front Z)</p>	<p><b>Co-Interior/Same-Side Angles:</b></p> <p>angles on the <b>same side</b> of the transversal and <b>inside</b> the path add to 180°</p> <p>This rule can be remembered by a C shape (or a back to front C)</p>
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**Corresponding Angles**

Both angles **above** the parallel line and **NOT** in the the path are equal

Both angles **below** the parallel lines and **NOT** in the the path are equal

This rule can be remembered by an F shape

The F can also be back to front

Don't worry if the parallel lines are facing the other direction.

Just turn your page sideways if it helps you

**Hack/Shortcut:**  
If we just remember the alternate interior angle (z angles) rule and the following 2 rules it is enough to work out all angles. However, you might be asked for name the angles, so you need to know the names which will be worth 1 mark only each time.

<p>Angles on a straight line add to 180°</p>	<p>Opposite angles are equal</p>
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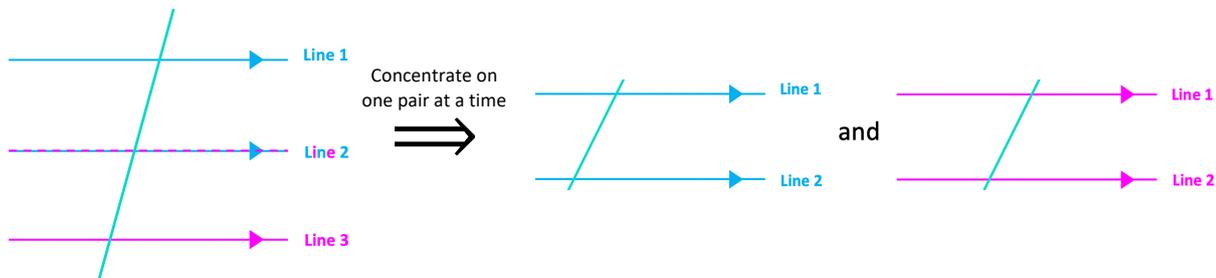
**Harder Questions:**

- Given 2 transversals

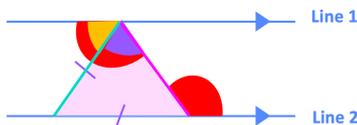
Concentrate on one transversal at a time

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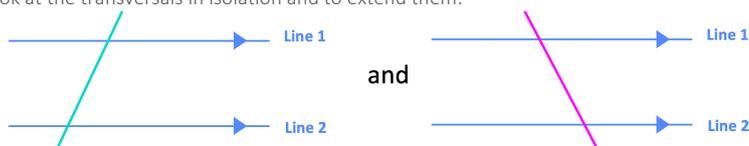
- Given 3 parallel lines



- Given 2 transversals that touch and form a triangle



Do not make the mistake that the red angle is equal to the purple angle (the Z angles are only equal if they both TOUCH the parallel lines. It can also help to look at the transversals in isolation and to extend them:



Polygons (n sides)

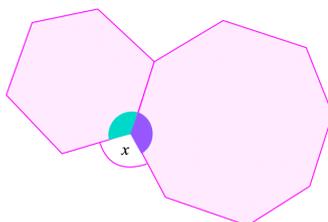
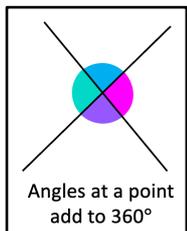


Sum Of All Interior Angles	1 Interior Angle	1 Exterior Angle	Number Of Sides	Angles At The Centre
$180(n - 2)$	$\frac{180(n - 2)}{n}$	$\frac{360}{n}$ <p>We can also use the formula</p> $180 - \text{interior angle}$ <p>Why can we use the second formula? This is because the interior and exterior angles are straight line angles interior + exterior = 180°</p>	$\frac{360}{\text{exterior angle}}$ <p>We can also use the formula</p> $\frac{360}{180 - \text{interior angle}}$	<p>Each angle at the centre</p> $\frac{360}{n}$

You may also need to use some angle rules:

Isosceles Triangle	Isosceles Triangle	Isosceles Trapezoid
<p>The base angles are equal</p> $\text{each} \triangle = \frac{180 - \text{top angle}}{2}$	<p>The base angles are equal</p> $\text{each} \triangle = \frac{180 - \text{top angle}}{2}$	$\text{each} \triangle = \frac{180 - \text{top angle}}{2}$ $\text{each} \triangle = \frac{180 - \text{bottom angle}}{2}$

You may also need to deal with multiple polygons



$$\frac{180(5 - 2)}{5} = 108^\circ$$

$$\frac{180(8 - 2)}{8} = 135^\circ$$

$$360 - 108 - 135 = 117^\circ$$