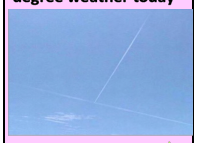
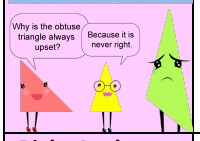
Angles

Name	Rules	© mymathscloud

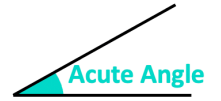
Classifications

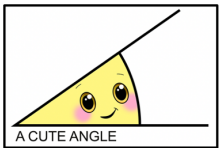




Acute

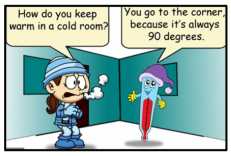
Less than 90°





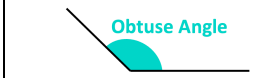
Right

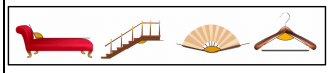
Equal to 90°



Obtuse

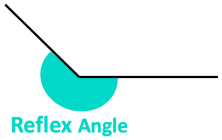
More than 90° but less than 180°





Reflex

More than 180° but less than 360°



Zero

Equal to 0°

Straight

Equal to 180°

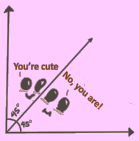
Straight Line Angle

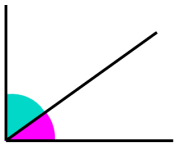
Full

Equal to 360°

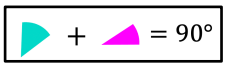
Full Rotation Angle

Right Angles

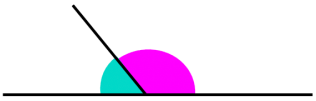




Angles in a right angle add to 90° and are called complementary

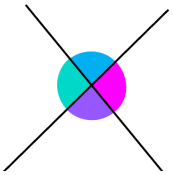


Straight Line Angles



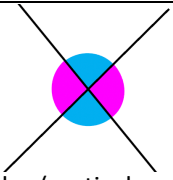
Angles on a straight line add to 180° and are called supplementary

Angles At A Point

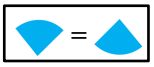


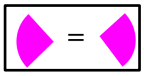
Angles at a point add to 360°

Vertical Angles



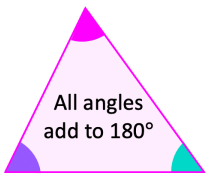
Opposite angles (vertical angles) are equal

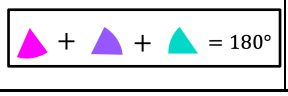




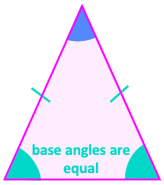
Triangles

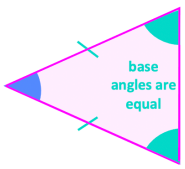
Sum of angles in any triangle

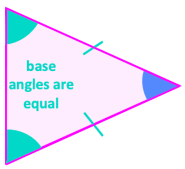


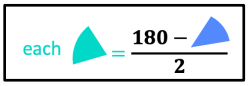


Isosceles Triangle Angles

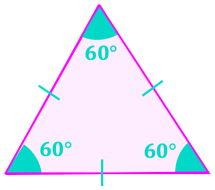




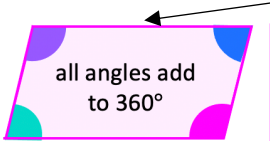


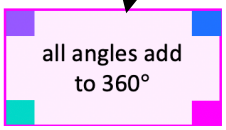


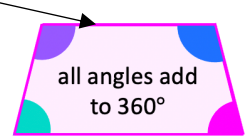
Equilateral Triangle Angles



Quadrilaterals







Isosceles Trapezium

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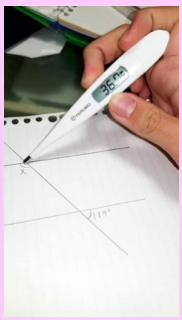
Parallelograms

Adjacent Angles

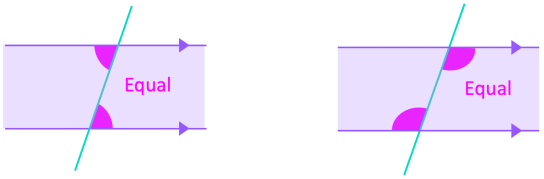
Opposite Angles

Parallel lines Cut By A Transversal



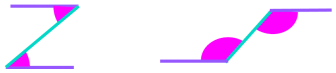
Parallel Lines Cut By A Transversal

Alternate Interior Angles:

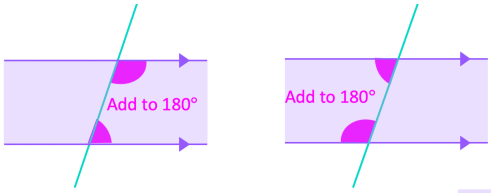


angles on **opposite sides** of the transversal and **inside** the path are equal

This rule can be remembered by a Z shape (or a back to front Z)



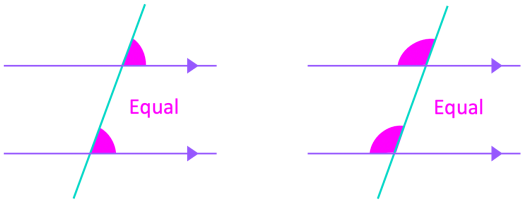
Co-Interior/Same-Side Angles:



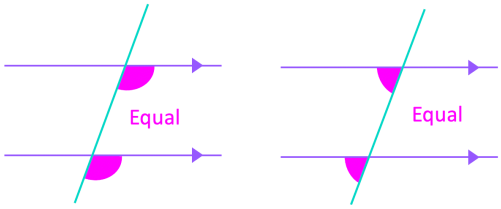
angles on **the same side** of the transversal and **inside** the path add to 180°

This rule can be remembered by a C shape (or a back to front C)

Corresponding Angles

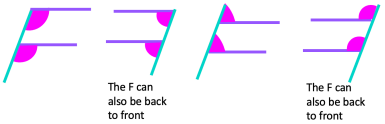


Both angles **above** the parallel line and NOT in the the path are equal

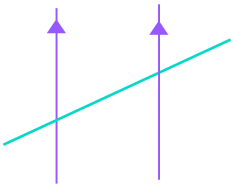


Both angles **below** the parallel lines and NOT in the the path are equal

This rule can be remembered by an F shape



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

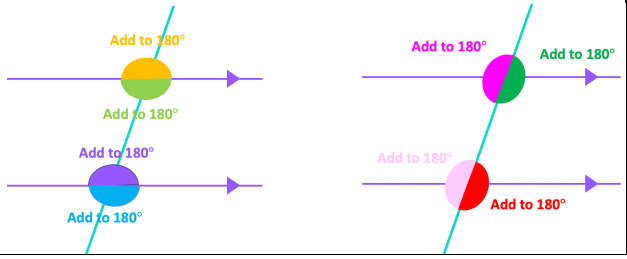


Just turn your page sideways if it helps you

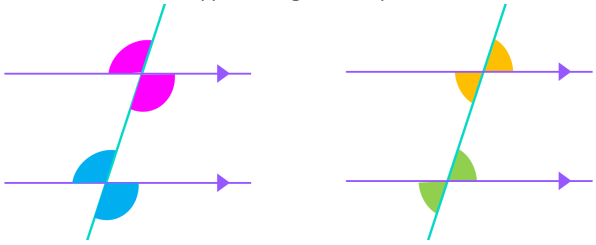
Hack/Shortcut:

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.

Angles on a straight line add to 180°

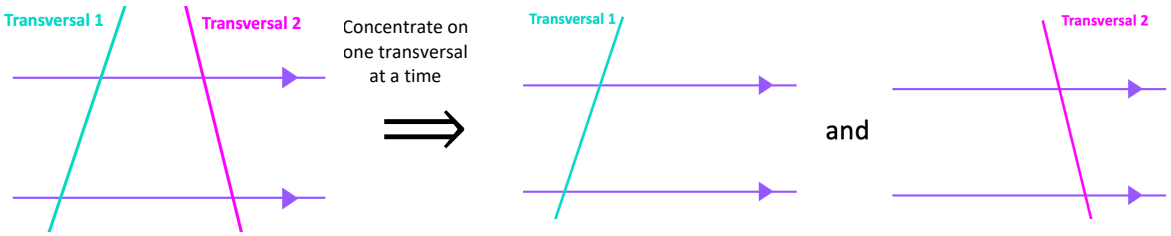


Opposite angles are equal

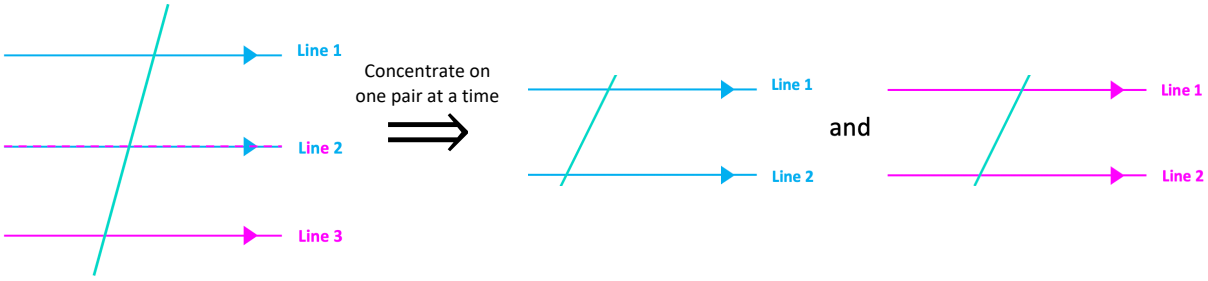


Harder Questions:

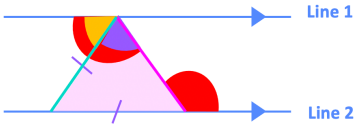
- Given 2 transversals



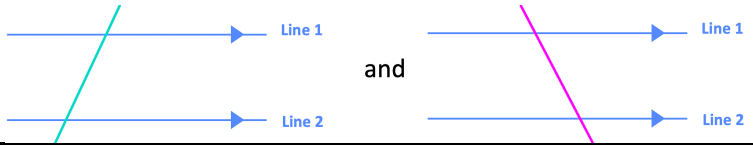
- Given 3 parallel lines



- 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)

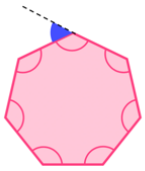
Sum Of All Interior Angles

$180(n-2)$

1 Interior Angle

$$\frac{180(n-2)}{n}$$

1 Exterior Angle



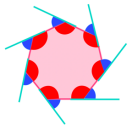
$$\frac{360}{n}$$

We can also use the formula

$$180 - \text{interior angle}$$

Why can we use the second formula? This is because the interior and exterior angles are straight line angles

interior + exterior = 180°



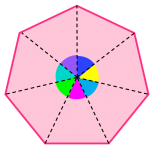
Number Of Sides

$$\frac{360}{\text{exterior angle}}$$

We can also use the formula

$$\frac{360}{180 - \text{interior angle}}$$

Angles At The Centre

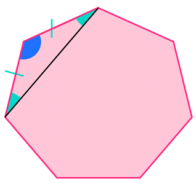


Each angle at the centre

$$\frac{360}{n}$$

You may also need to use some angle rules:

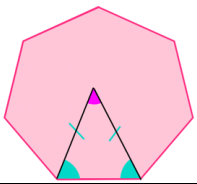
Isosceles Triangle



The base angles are equal

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

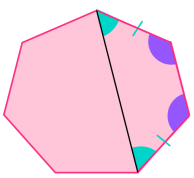
Isosceles Triangle



The base angles are equal

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

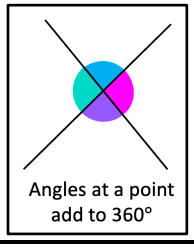
Isosceles Trapezoid

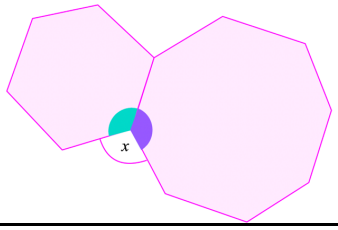


each $\blacktriangle = \frac{180 - \blacktriangle - \blacktriangle}{2}$

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

You may also need to deal with multiple polygons





$$\frac{180(5-2)}{5} = 108°$$

$$\frac{180(8-2)}{8} = 135°$$

$$360 - 108 - 135 = 117°$$