

Discussion Problems

Step 5: Angles on a Straight Line

National Curriculum Objectives:

Mathematics Year 5: (5G4b) [Identify angles at a point and one whole turn \(total 360 degrees\) and angles at a point on a straight line and half a turn \(total 180 degrees\).](#)

About this resource:

This resource has been designed for pupils who understand the concepts within [this step](#). It provides pupils with more opportunities to enhance their reasoning and problem solving skills through more challenging problems. Pupils can work in pairs or small groups to discuss with each other about how best to tackle the problem, as there is often more than one answer or more than one way to work through the problem.

There may be various answers for each problem. Where this is the case, we have provided one example answer to guide discussion.

We recommend self or peer marking using the answer page provided to promote discussion and self-correction.

More [Year 5 Properties of Shapes](#) resources.

Did you like this resource? Don't forget to [review](#) it on our website.

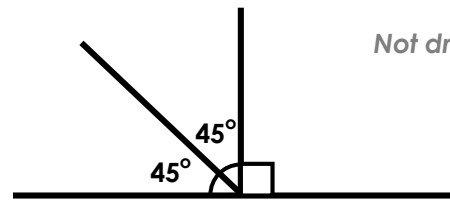
Angles on a Straight Line

1. Noah is trying to work out how a right angle affects the other angles on a straight line. He has experimented below and has come up with a theory.

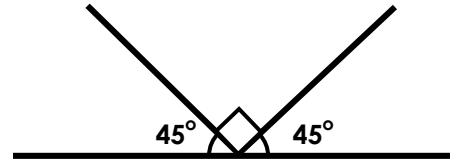
He says,



If there are three angles on a straight line and one is a right angle, the other two angles must be 45° every time.



Not drawn to scale.



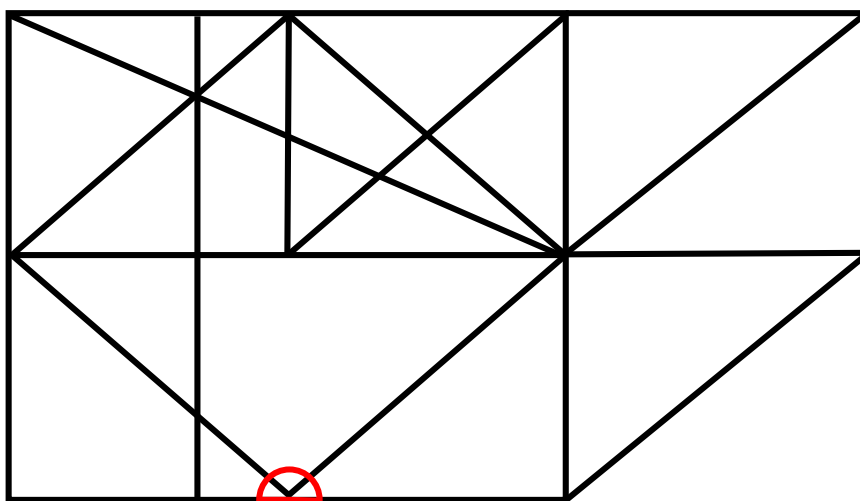
Investigate whether Noah is correct. How could you prove or disprove his theory?

DP

2. Look at the shape below. Explore how many groups of angles there are on a straight line within the shape. One has been done for you.

A group will need to consist of at least three angles.

Not drawn to scale.



DP

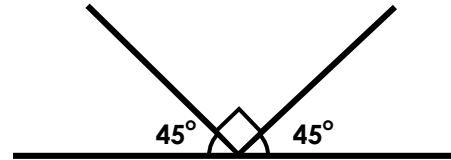
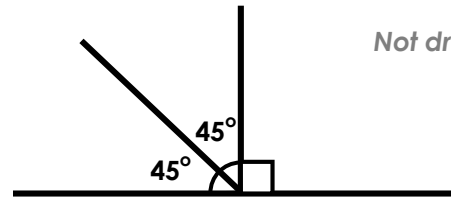
Angles on a Straight Line

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He says,



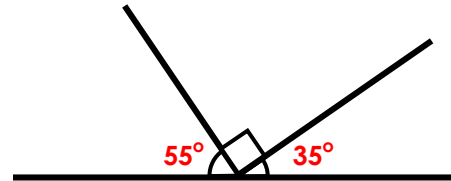
If there are three angles on a straight line and one is a right angle, the other two angles must be 45° every time.



Investigate whether Noah is correct. How could you prove or disprove his theory?

Noah is incorrect. Depending on where the right angle is on the straight line, the other two angles can vary.

Various answers possible including:

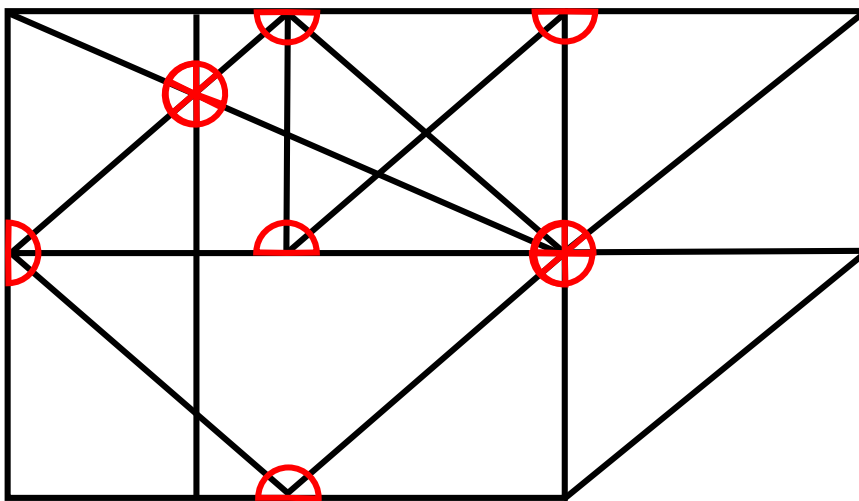


DP

2. Look at the shape below. Explore how many groups of angles there are on a straight line within the shape. One has been done for you.

A group will need to consist of at least three angles.

Not drawn to scale.



There are 17 groups of angles on a straight line that contain at least three angles within the shape above.

DP