Reasoning and Problem Solving
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).

Differentiation:

Questions 1, 4 and 7 (Reasoning)
Developing Explain whether a child is correct when measuring angles on a straight line. All angles are in increments of 5°.
Expected Explain whether a child is correct when measuring angles on a straight line. All angles are in increments of 1°.
Greater Depth Explain whether a child is correct when measuring angles on a straight line. All angles are in increments of 1°.

Questions 2, 5 and 8 (Problem solving)
Developing Work out what a missing digit should be using knowledge of angles on a straight line. All angles are in increments of 5° on a horizontal line with up to two angles labelled with degrees.
Expected Work out what a missing digit should be using knowledge of angles on a straight line. All angles are in increments of 1° on a horizontal line with up to two angles labelled with degrees.
Greater Depth Work out what two missing digits should be using knowledge of angles on a straight line. All angles are in increments of 1° on a horizontal line. One angle is fully labelled with degrees.

Questions 3, 6 and 9 (Reasoning)
Developing Decide if a statement is correct or incorrect using knowledge of angles on a straight line. All angles are in increments of 5° on a horizontal line with up to two angles labelled with degrees.
Expected Decide if a statement is correct or incorrect using knowledge of angles on a straight line. All angles are in increments of 1° on a horizontal line with up to two angles labelled with degrees.
Greater Depth Decide if a statement is correct or incorrect using knowledge of angles on a straight line. All angles are in increments of 1° on a horizontal line. One angle is labelled with degrees and clues are given to calculate the missing angles.

More Year 5 Properties of Shapes resources.

Did you like this resource? Don't forget to review it on our website.

classroomsecrets.co.uk

Reasoning and Problem Solving – Angles on a Straight Line – Teaching Information

Angles on a Straight Line	Angles on a Straight Line

1a. James is measuring angles on a straight line.
He says:

> There are two angles on the line. One is 110° and the other is 60°.

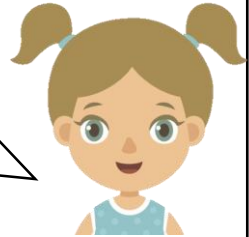Could he be right? Explain how you know.

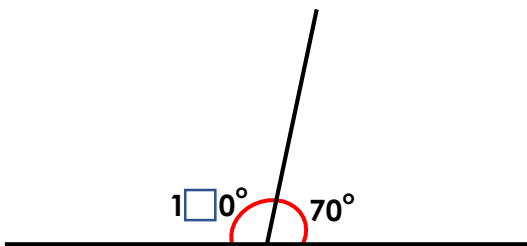**1b.** Harper is measuring angles on a straight line.
She says:

> There are two angles on the line. One is 100 ° and the other is 80°.
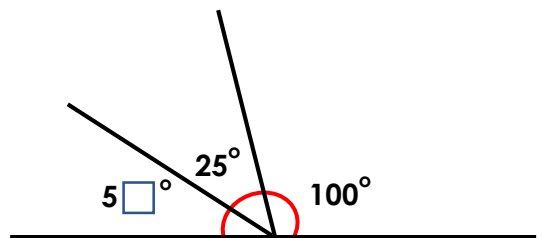
Could she be right? Explain how you know.

2a. One of the angles below has lost a digit. What should the missing digit be?
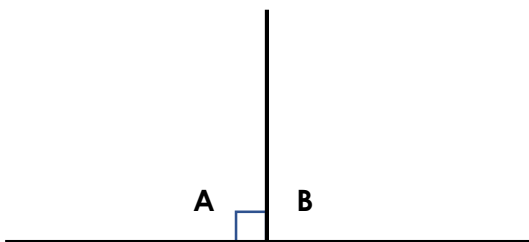
1□0°   70°

Angles not drawn to scale

2b. One of the angles below has lost a digit. What should the missing digit be?

25°
5□°   100°
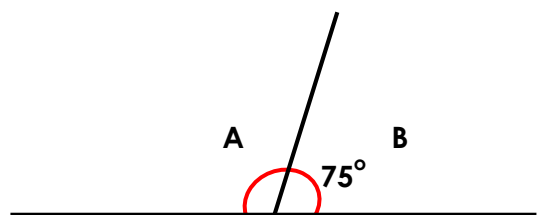
Angles not drawn to scale

3a. John says angle B is the same as angle A. Do you agree? Explain your answer.

A   B

Angles not drawn to scale

3b. Theresa says that angle A is the same as angle B. Do you agree. Explain your answer.

A   B
75°

Angles not drawn to scale

classroomsecrets.co.uk

Reasoning and Problem Solving – Angles on a Straight Line – Year 5 Developing

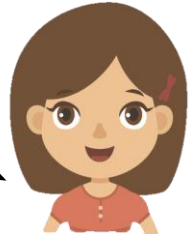**4a.** Tyler is measuring angles on a straight line.
He says:

> There are three angles on the line. One is 110°, one is 10° and the other is 60°.

Could he be right? Explain how you know.

⭐ E

R

4b. Isabelle is measuring angles on a straight line.
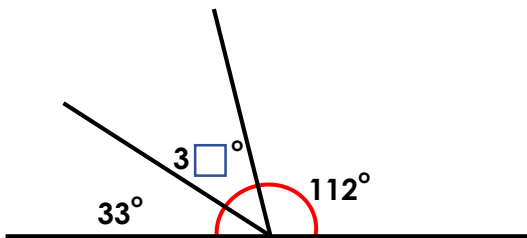She says:

> There are three angles on the line. One is 100°, one is 30° and the other is 55°.
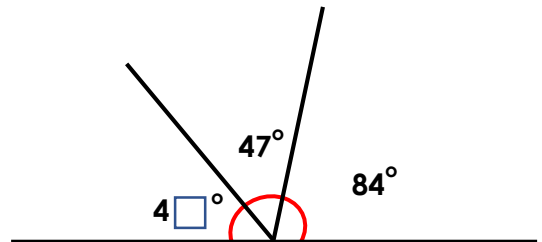
Could she be right? Explain how you know.

⭐ E

R

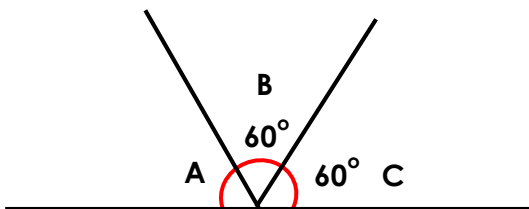**5a.** One of the angles below has lost a digit. What should the missing digit be?

3 ☐°

33°   112°

⭐ E

Angles not drawn to scale   PS

5b. One of the angles below has lost a digit. What should the missing digit be?

47°

84°

4 ☐°

⭐ E

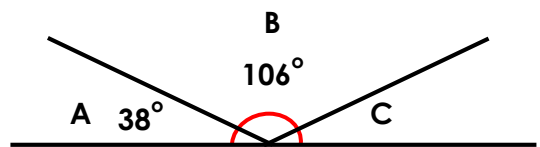*Angles not drawn to scale*   PS

6a. Jim says that angle A is the same as angle B and C. Do you agree? Explain your answer.

B
60°
A   60° C

⭐ E

Angles not drawn to scale   R

6b. Jen says that angle C is the same as angle A. Do you agree? Explain your answer.

B
106°
A   38°   C

⭐ E

Angles not drawn to scale   R

classroomsecrets.co.uk

Reasoning and Problem Solving – Angles on a Straight Line – Year 5 Expected

Angles on a Straight Line

Angles on a Straight Line

7a. Eryk is measuring angles on a straight line.
He says:

> There are three angles on a line. One is 19°, one is a right angle and the other is 61°.
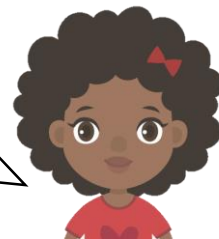
Could he be right? Explain how you know.

R

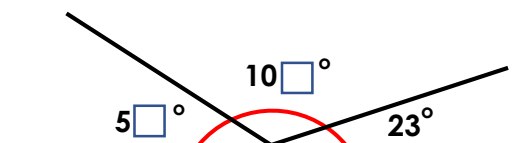**7b.** Kristi is measuring angles on a straight line.
She says:

> There are three angles on the line. One is 89° degrees, one is a right angle and the other is 1°.

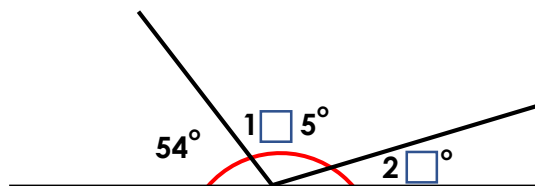Could she be right? Explain how you know.

R

8a. Two of the angles below have lost a digit. What should the missing digits be?

10□°
5□°
23°

Angles not drawn to scale   PS

8b. Two of the angles below have lost a digit. What should the missing digits be?

54°
1□5°
2□°

Angles not drawn to scale   PS

9a. Pam says that angle A and B are the same as angle C if each angle is equal. Do you agree? Explain your answer.

B
One third of 180°
A   60° C

Angles not drawn to scale   R

9b. Tim says that angle B is the same as angle C. Do you agree? Explain your answer.

B
A   Half of a right angle   67° C

Angles not drawn to scale   R

classroomsecrets.co.uk

Reasoning and Problem Solving – Angles on a Straight Line – Year 5 Greater Depth

Reasoning and Problem Solving
Angles on a Straight Line

Reasoning and Problem Solving
Angles on a Straight Line

Developing

1a. James cannot be right as his angles only total 170°.

2a. The missing digit is a 1.

3a. John is correct as both angles A and B are 90° angles. Two 90° angles makes 180°.

Expected

4a. Tyler could be right as his angles total 180°.

5a. The missing digit is a 5.

6a. Jim is correct as 60° + 60° = 120°. 180° – 120° = 60° which is the same as angle B and C.

Greater Depth

7a. Eryk cannot be right as his angles total 170°.

8a. The missing digits are a 4 and a 3.

9a. Pam is correct as one third of 180° = 60° so 60° + 60° = 120°. 180° – 120° = 60° which is the same as angle C at 60°.

Developing

1b. Harper could be right as her angles total 180º.

2b. The missing digit is a 5.

3b. Theresa is incorrect as 180° – 75° = 105° so angle A must be 105° which is different to angle B at 75°.

Expected

4b. Isabelle cannot be right as her angles total 185°.

5b. The missing digit is a 9.

6b. Jen is incorrect as 106° + 38 $^{\circ}$= 144. 180° – 144° = 36° which is different to angle A at 38°.

Greater Depth

7b. Kristi could be right as her angles total 180°.

8b. The missing digits are a 0 and a 1.

9b. Tim is incorrect as half of a right angle is 45° so 45° + 67° = 112°. 180° – 112° = 68° which is different to angle C at 67°.

classroomsecrets.co.uk
Reasoning and Problem Solving – Angles on a Straight Line ANSWERS