MATHS FIELD GUIDE · GRADE 4

An angle measures a turn

OPENING PROBLEM

How much of a right angle is shown?



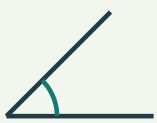
02 Follow the turn, then name the angle
03 Rules and worked cases
04 Opening the gate
05 Identify the angle relationship
06 Check your reasoning

ILLUSTRATED PROBLEM SHEET

Follow the turn, then name the angle

Trace from one ray to the next. The amount of turn determines the angle.

1



How much of a right angle is shown?

Half of 90°. Two such turns in the same direction make a right angle.

2



How many quarter-turns make a half-turn?

Two. Two right angles total 180°.

3



Which kind of angle is this?

Obtuse. It is larger than a right angle and smaller than a straight angle.

4



What do the two rays form?

A straight line. Another half-turn brings you all the way around.

A clockwise quarter-turn then another **a half-turn.**

A clockwise quarter-turn then an anticlockwise quarter-turn **back to the start.**

CHAPTER PROBLEM

The rays of an angle are extended. Does its degree measure change? Why?

No. Extending the rays does not change their directions or the turn between them.

MATHS REFERENCE · GRADE 4

An angle measures a turn

An angle describes the turn between two rays with a common endpoint. The endpoint is the vertex. Degrees measure the size of the turn. A full turn is 360°, a half turn is 180° and a quarter turn is 90°.

Four cases to recognise

Situation	What to do and why
One eighth of a full turn	360° ÷ 8 = 45°, an acute angle.
A straight angle split into 64° and a missing angle	180° − 64° = 116°.
A clock turns from 12 to 4 clockwise	Four of twelve equal intervals give 120°.
Two drawings have different arm lengths	Align their vertices and one ray. The second ray decides the larger angle.

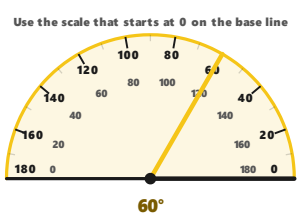
Read the model

Build the idea

Hold one ray still and turn the other around the vertex. The gap changes because the turn changes.

A protractor places a degree scale around the same centre. Its centre goes on the vertex and its zero line follows one ray.

Measure 60°



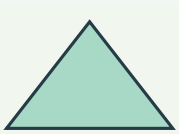
Protractor

Why it works

Longer rays do not make a larger angle. The amount of turning between their directions determines the angle.

An acute angle is less than a right angle. An obtuse angle is more than a right angle and less than a straight angle.

ray A line starting at one point and extending in one direction.
vertex The common endpoint of the rays.
degree A unit of angle measure.



3 sides

Where does a side end?

At a corner. Three sides meet at three corners.

WORKED INVESTIGATION

Opening the gate

Imagine looking down at a gate on a hinge. The closed and open positions form two rays; the turn between them is the angle.

Look at this part	What it tells you
Quarter turn	90°
Half turn	180°
Full turn	360°

Work it through

A gate opens 60° and then another 30° in the same direction. Draw adjacent arcs at the hinge to see one right angle.

Catch the mistake

A longer gate swings its tip farther but still turns through the same angle. Compare the directions, not the tip distances.

Compare the cases

Follow an example

To measure a 60° angle, align the protractor's centre and baseline. Read from the zero on the baseline side to the other ray.

If the ray meets 60 on the chosen scale, the turn is 60°. Estimate first: it should be smaller than a right angle.

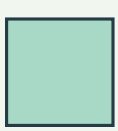
What changes? What stays true?

A protractor may have two scales. Choose the one that begins at zero along your baseline.

If the vertex is misplaced or the baseline is not aligned, even reading the right numeral will not give a valid measurement.

Change one condition

If the gate opens 110° then closes back by 20°, the final opening is 90° from its starting position.



4 sides

What stays true if the page turns?

Four equal straight sides and four square corners.

ILLUSTRATED PROBLEM SHEET

Identify the angle relationship

Straight lines, full turns and right angles give different totals.

1



How much more completes a right angle?

30°. A right angle measures 90°.

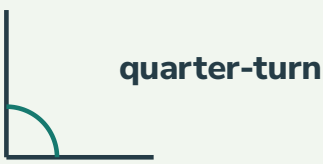
2



How much more completes a straight angle?

55°. The adjacent angles together measure 180°.

3



How many such turns make a full turn?

Four. Four times 90° gives 360°.

4

Triangle angles	Given	Missing
A	50° and 60°	70°
B	35° and 35°	110°

Why do both rows use 180°?

The three interior angles of each plane triangle sum to a straight angle.

A straight angle split equally
two 90° angles.

A full turn split equally three ways
three 120° angles.

CHAPTER PROBLEM

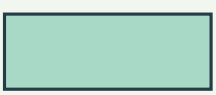
Face north. Turn clockwise one quarter-turn, then another quarter-turn. Which way are you facing?

East after the first turn and south after the second. Together the turns make 180°.

QUESTION BANK · FOLD OR COVER THE RIGHT COLUMN

Check your reasoning

Try the problem	Solution and reasoning
01 Do longer arms on a drawing make the angle bigger?	No. The directions of the arms determine the turn.
02 Two angles are both 65°. Must they be vertically opposite?	No. Equal measure alone does not tell you where the rays meet.
03 A door opens through a right angle and then another 35°. Is the final angle acute or obtuse?	90° + 35° = 125°. It lies between 90° and 180°, so it is obtuse.
04 An angle is 17° less than a right angle. What is it?	90° – 17° = 73°, an acute angle.
05 Two angles around a point are 135° and 90°. What is the remaining angle?	Subtract from 360°. The remaining angle is 135°.



4 corners

How does this compare with the square?

Both have four square corners. This rectangle has long and short sides.

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