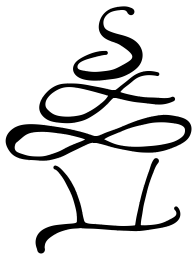
Practice Booklet

MYP 1 · Year 7 Mathematics

Unit 7.8 · Angles

Name: _____

7.8.1 · 7.8.2	Measure angles · Classify angles · Questions 1–13
7.8.3	Classifying triangles · Questions 14–26
7.8.4	Angles in parallel lines · Questions 27–39
7.8.5	Angle facts · Questions 40–52
7.8.6	Classifying quadrilaterals · Questions 53–65
Homework	Homework page and checking record
Answers	For checking and correcting in green pen



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How to use this booklet and your homework

READ THIS FIRST

Choosing your level

Every part of the unit has four levels. Start where you feel comfortable and move between them freely. Most questions ask you to explain as well as answer, because being able to say *why* is what makes a method stick.

Learning
Small numbers, with counters or a diagram beside you.

Practising
The standard question, with your reasoning written out.

Challenging
Working backwards, and finding what is wrong with someone else's thinking.

Mastery
Explaining why a rule must be true, and testing it on new cases.

Working on your homework

Pens and setting out

- Answers in blue or black non-erasable pen, or in pencil.
- Colour and highlighters are for annotating your work and showing the steps of a method.
- Never erase a mistake. Rework it underneath so you can see what changed.

Green pen is for checking. When you finish, use the answers at the back to check your work.

- **Got it wrong?** Circle the question number, then make your correction and write your error analysis in green pen.
- **Still can't work out how to solve it?** Put a star ★ next to the question number, so we know to go over it in class.

Each sheet

- Your name goes on every sheet, because they are handed in one at a time.
- Each question is worth up to 3 marks. If a question has parts (a, b, c...), each part is marked out of 3. At the end of each level, write your score out of the total for that level.
- Questions are numbered 1, 2, 3... all the way through the booklet, so we can say exactly which ones to do.
- If you are stuck after trying, ask for help. Showing me what you tried is a good start.

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7.8.1 Measure angles · 7.8.2 Classify angles

LEARNING · PRACTISING

Name:

Key vocabulary

Word	Meaning	Example
vertex	the point where two lines meet to make an angle	B in angle ABC
protractor	a tool for measuring angles in degrees	a semicircle with 0° to 180°
acute	an angle less than 90°	60°
obtuse	an angle more than 90° and less than 180°	120°
reflex	an angle more than 180° and less than 360°	200°

A right angle is exactly 90° and a straight angle is exactly 180°.

Learning

1 Name each type of angle: a) 30° b) 90° c) 120° d) 200°

2 How many degrees are there in a straight line? In a full turn?

3 An angle is 75°. Is it acute or obtuse? How do you know?

4 Angle ABC has its vertex at B. Draw a sketch and mark the angle

Learning score _____ / 21

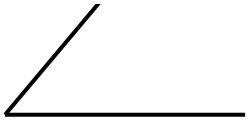
Practising

5 Classify each angle: a) 89° b) 91° c) 180° d) 270° e) 359°

6 Use a protractor to draw an angle of 65°

7 On a clock face, what is the angle between the 12 and the 3? Between the 12 and the 4?

8 Estimate this angle, then measure it with a protractor



Practising score _____ / 24

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Name:

Challenging

9 What is the smaller angle between the hands of a clock at 5 o'clock?

10 A reflex angle is 235°. What angle is needed to complete a full turn?

11 **Find and describe the mistake.** Jade says an angle that looks acute measures 125° on her protractor

Challenging score _____ / 9

Mastery

12 Why is it a good idea to estimate before you measure an angle? Give an example

13 How many degrees does the minute hand of a clock turn in 10 minutes? In 1 minute?

Mastery score _____ / 6

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7.8.3 Classifying triangles

LEARNING · PRACTISING

Name:

Key vocabulary

Word	Meaning	Example
scalene	a triangle with no equal sides	3 cm, 4 cm, 5 cm
isosceles	a triangle with two equal sides and two equal angles	5 cm, 5 cm, 8 cm
equilateral	a triangle with three equal sides and three 60° angles	6 cm, 6 cm, 6 cm
right-angled	a triangle with one 90° angle	3-4-5 triangle
obtuse-angled	a triangle with one angle more than 90°	100°, 40°, 40°

The angles in a triangle always add up to 180°.

Learning

14 A triangle has sides 5 cm, 5 cm and 5 cm. What is it called?

15 A triangle has sides 3 cm, 4 cm and 5 cm. No sides are equal. What is it called?

16 A triangle has two equal sides and a third side that is different. What is it called?

17 A triangle has one angle of 90°. What type of triangle is it?

Learning score _____ / 12

Practising

18 Classify by sides: a) 6, 6, 9 b) 4, 5, 7 c) 8, 8, 8

19 Classify by angles: a) 60°, 60°, 60° b) 100°, 40°, 40° c) 90°, 45°, 45°

20 A triangle has angles of 50°, 50° and 80°. Describe it as fully as you can

21 How many equal sides does a scalene, an isosceles and an equilateral triangle have?

Practising score _____ / 24

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7.8.3 Classifying triangles

Name:

Challenging

22 Can a triangle have two right angles? Explain

23 An isosceles triangle has one angle of 40°. Find the other two angles. There are two answers

24 **Find and describe the mistake.** Kai says a triangle with angles 90°, 50° and 50° is possible

Challenging score _____ **/ 9**

Mastery

25 Explain why a triangle cannot have two obtuse angles

26 True or false: every equilateral triangle is also isosceles. Explain

Mastery score _____ **/ 6**

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7.8.4 Angles in parallel lines

LEARNING · PRACTISING

Name:

Key vocabulary

Word	Meaning	Example
transversal	a line that crosses two or more lines	the line across
corresponding angles	in matching positions; equal	F shape
alternate angles	on opposite sides of the transversal, between the parallel lines; equal	Z shape
co-interior angles	between the parallel lines, same side; add up to 180°	C shape

Vertically opposite angles are opposite each other where two lines cross, and are equal. Arrows on lines show that they are parallel.

Learning

27 A straight line crosses two parallel lines. What do you know about corresponding angles?

28 What do you know about alternate angles?

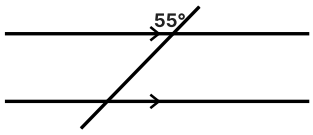
29 What do co-interior angles add up to?

30 Two straight lines cross and one angle is 70°. What is the angle opposite it?

Learning score _____ / 12

Practising

31 A line crosses two parallel lines. The marked angle is 55°. Find a corresponding angle, an alternate angle and a co-interior angle for it



32 An angle is 110°. What is its co-interior angle? What is its alternate angle?

33 Angle x and an angle of 48° are alternate angles between parallel lines. Find x and give the reason

34 Angle y and an angle of 132° are co-interior angles between parallel lines. Find y and give the reason

Practising score _____ / 12

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7.8.4 Angles in parallel lines

Name:

Challenging

35 Two co-interior angles are 3x and 2x. Find x and both angles

36 Two alternate angles are 4y − 10 and 2y + 30 (in degrees). Find y and the size of the angles

37 **Find and describe the mistake.** Mo says co-interior angles are equal because they are between parallel lines

Challenging score _____ / 9

Mastery

38 Explain why alternate angles are equal, using corresponding angles and vertically opposite angles

39 Draw two parallel lines crossed by a straight line, with one angle marked 62°. Work out and label all eight angles

Mastery score _____ / 6

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7.8.5 Angle facts

LEARNING · PRACTISING

Name:

Key vocabulary

Word	Meaning	Example
angles on a straight line	add up to 180°	120° + 60° = 180°
angles around a point	add up to 360°	90° + 90° + 90° + 90°
interior angle	an angle inside a shape	the angles of a triangle
exterior angle	the angle outside a shape between one side extended and the next side	110° next to 70°
angle sum	the total of the angles in a shape	triangle 180°, quadrilateral 360°

Always write the reason: the angles on a straight line add up to 180°.

Learning

40 Angles on a straight line are 120° and x. Find x

41 Angles around a point are 90°, 120°, 100° and x. Find x

42 Two angles in a triangle are 60° and 70°. Find the third angle

43 Three angles in a quadrilateral are 90°, 90° and 90°. Find the fourth angle

Learning score _____ / 12

Practising

44 Three angles on a straight line are 40°, 65° and x. Find x

45 The angles in a triangle are 2x, 3x and 4x. Find x and the three angles

46 Three angles in a quadrilateral are 85°, 95° and 110°. Find the fourth angle

47 An isosceles triangle has an angle of 40° at the top. Find the two base angles

Practising score _____ / 12

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7.8.5 Angle facts

CHALLENGING · MASTERY

Name:

Challenging

48 In a triangle, one angle is 20° more than another and the third angle is 100°. Find all three angles

49 A triangle has interior angles of 50° and 60°. Find the third interior angle and the exterior angle next to it. What do you notice?

50 **Find and describe the mistake.** Beth says the angles in a quadrilateral add up to 180° because it is made from triangles

Challenging score _____ **/ 9**

Mastery

51 Draw a quadrilateral and a diagonal. Use the diagram to explain why its angles add up to 360°

52 Tear the corners off a paper triangle and put them together along a line. What do you see, and what does it show?

Mastery score _____ **/ 6**

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7.8.6 Classifying quadrilaterals

LEARNING · PRACTISING

Name:

Key vocabulary

Word	Meaning	Example
parallelogram	opposite sides equal and parallel	a slanted rectangle
rhombus	four equal sides, opposite sides parallel	a squashed square
kite	two pairs of equal sides that are next to each other	a kite shape
trapezium	exactly one pair of parallel sides	a shape like a table top
diagonal	a line joining opposite corners	a square has two

Describe a shape by its sides, angles, diagonals and lines of symmetry.

Learning

53 Name the quadrilateral with four equal sides and four right angles

54 Name the quadrilateral with two pairs of equal, parallel sides and four right angles

55 Name the quadrilateral with exactly one pair of parallel sides

56 How many lines of symmetry does a square have?

Learning score _____ / 12

Practising

57 Which of these have diagonals that cross at right angles: square, rectangle, rhombus, kite?

58 How many lines of symmetry do these have: rectangle, rhombus, kite, parallelogram?

59 Describe a parallelogram using its sides and its angles

60 A quadrilateral has four equal sides but no right angles. What is it?

Practising score _____ / 12

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7.8.6 Classifying quadrilaterals

Name:

Challenging

61 Which of these have both pairs of opposite sides parallel: square, rectangle, rhombus, parallelogram, kite, trapezium?

62 Is every square a rectangle? Is every rectangle a square? Explain

63 **Find and describe the mistake.** Eli says a kite has two pairs of parallel sides

Challenging score _____ **/ 9**

Mastery

64 Which properties do a rhombus and a square share? Which belong only to the square?

65 Name a quadrilateral that has exactly one line of symmetry and is not a kite

Mastery score _____ **/ 6**

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Homework and checking record

HAND THIS PAGE IN WITH YOUR SHEETS

Name:

Your teacher will tell you which sheet and questions to do. Choose your level, set out your work in pen or pencil, then check it with the answers at the back using a **green pen**: circle wrong question numbers, and star ★ any you still cannot solve.

Sheet	Questions	Which ones I did	Checked in green ✔	Teacher
7.8.1 Measure angles · 7.8.2 Classify angles	Q1–13			
7.8.3 Classifying triangles	Q14–26			
7.8.4 Angles in parallel lines	Q27–39			
7.8.5 Angle facts	Q40–52			
7.8.6 Classifying quadrilaterals	Q53–65			

Error analysis

Circle the number of any question you got wrong. Star ★ it if you still cannot solve it after correcting. Then write the questions you need to rework, and what you will do differently:

One thing I understand better now

Score: Parent / guardian signature:

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Answers

CHECK IN GREEN PEN

7.8.1 Measure angles · 7.8.2 Classify angles

Learning	**1**	a) acute b) right angle c) obtuse d) reflex
	2	180° in a straight line and 360° in a full turn
	3	Acute. It is less than 90°
	4	B is the corner where the two arms meet. A and C are on the ends of the arms. The curve is drawn at B
Practising	**5**	a) acute b) obtuse c) straight d) reflex e) reflex
	6	The angle measures 65°. Check that you used the correct scale, starting from 0
	7	Each hour is 360° ÷ 12 = 30°. 12 to 3 is 3 × 30° = 90°. 12 to 4 is 4 × 30° = 120°
	8	The angle is about 50°. A good estimate is within 10° of the measurement
Challenging	**9**	5 × 30° = 150°
	10	360° − 235° = 125°
	11	An acute angle is less than 90°, so 125° cannot be right. She read the wrong scale. The angle is 180° − 125° = 55°
Mastery	**12**	The estimate shows when you have read the wrong scale. For example, an angle that looks acute cannot be 125°
	13	360° ÷ 60 = 6° in 1 minute, so 10 × 6° = 60° in 10 minutes

7.8.3 Classifying triangles

Learning	**14**	Equilateral. All three sides are equal
	15	Scalene
	16	Isosceles
	17	A right-angled triangle
Practising	**18**	a) isosceles b) scalene c) equilateral
	19	a) acute-angled b) obtuse-angled c) right-angled
	20	It has two equal angles, so it is isosceles. All three angles are less than 90°, so it is acute-angled
	21	Scalene has none, isosceles has two and equilateral has three
Challenging	**22**	No. Two right angles add up to 180°, which leaves 0° for the third angle
	23	If 40° is one of the equal angles: 40°, 40° and 100°. If 40° is the different angle: (180° − 40°) ÷ 2 = 70°, so 40°, 70° and 70°
	24	The angles add up to 190°. The angles in a triangle must add up to 180°, so this triangle is not possible
Mastery	**25**	Each obtuse angle is more than 90°, so two of them add up to more than 180°. The angles in a triangle add up to exactly 180°
	26	True, if isosceles means at least two equal sides. An equilateral triangle has three equal sides, so it has two equal sides as well

7.8.4 Angles in parallel lines

Learning	**27**	Corresponding angles are equal (look for the F shape)
	28	Alternate angles are equal (look for the Z shape)
	29	180° (look for the C shape)
	30	70°. Vertically opposite angles are equal
Practising	**31**	Corresponding: 55°. Alternate: 55°. Co-interior: 180° − 55° = 125°
	32	Co-interior: 180° − 110° = 70°. Alternate: 110°
	33	x = 48°. Alternate angles are equal
	34	y = 180° − 132° = 48°. Co-interior angles add up to 180°
Challenging	**35**	3x + 2x = 180°, so 5x = 180° and x = 36°. The angles are 108° and 72°
	36	Alternate angles are equal: 4y − 10 = 2y + 30, so 2y = 40 and y = 20. Each angle is 4 × 20 − 10 = 70°
	37	Alternate angles are equal, but co-interior angles add up to 180°. They are only equal when both are 90°
Mastery	**38**	An alternate angle is vertically opposite to an angle that is corresponding to the other one. Vertically opposite angles are equal and corresponding angles are equal, so the alternate angles are equal
	39	Four angles are 62° and four angles are 118° (180° − 62°)

7.8.5 Angle facts

Learning	**40**	x = 180° − 120° = 60°
	41	90° + 120° + 100° = 310°, so x = 360° − 310° = 50°
	42	180° − (60° + 70°) = 50°
	43	360° − 270° = 90°
Practising	**44**	40° + 65° = 105°, so x = 180° − 105° = 75°
	45	9x = 180°, so x = 20°. The angles are 40°, 60° and 80°
	46	85° + 95° + 110° = 290°, so the fourth angle is 360° − 290° = 70°
	47	180° − 40° = 140°, and 140° ÷ 2 = 70° for each base angle
Challenging	**48**	Let the smaller angle be x. Then x + (x + 20) + 100 = 180, so 2x = 60 and x = 30. The angles are 30°, 50° and 100°
	49	The third angle is 70°. The exterior angle is 180° − 70° = 110°. It equals 50° + 60°, the sum of the other two interior angles
	50	A quadrilateral is made from two triangles, not one. 2 × 180° = 360°, so its angles add up to 360°
Mastery	**51**	The diagonal splits the quadrilateral into two triangles. Each triangle has angles that add up to 180°, so the quadrilateral has 2 × 180° = 360°
	52	The three corners fit together on a straight line. This shows that the angles in a triangle add up to 180°

7.8.6 Classifying quadrilaterals

Learning	**53**	A square
	54	A rectangle. A square is a special rectangle
	55	A trapezium
	56	4
Practising	**57**	Square, rhombus and kite
	58	Rectangle 2, rhombus 2, kite 1, parallelogram 0
	59	Opposite sides are equal and parallel. Opposite angles are equal. It does not usually have right angles
	60	A rhombus
Challenging	**61**	Square, rectangle, rhombus and parallelogram
	62	Every square is a rectangle because it has four right angles and equal opposite sides. A rectangle is not always a square because its sides need not all be equal
	63	A kite has no parallel sides. It has two pairs of equal sides that are next to each other
Mastery	**64**	They share four equal sides, opposite sides parallel and diagonals that cross at right angles. Only the square has four right angles, diagonals of equal length and 4 lines of symmetry
	65	An isosceles trapezium