MARKING GUIDELINE

MARKS	DURATION	QUESTIONS
29	45 minutes	3

Name: _____ Class: _____

Date: _____

MARK ____ / 29

INSTRUCTIONS AND INFORMATION

1. Answer **ALL** the questions in this question paper.
2. Answer QUESTION 1 by **circling** the letter (A–D) in the answer grid at the end of that section.
3. Show **ALL** calculations clearly.
4. Show all units where applicable.
5. Number the answers correctly according to the numbering system used in this question paper.
6. A non-programmable calculator may be used, unless stated otherwise.
7. Write neatly and legibly.

QUESTION 1 [10 MARKS]

Four options are given as possible answers to the following questions. Choose the correct answer and circle the letter (A–D) in the grid at the end of this section. If you want to change your choice, put a cross through the wrong letter and circle your new choice.

1.1 Which instrument is used to draw a circle of a given radius? (1)

A) protractor **B)** set square

C) ruler **D) pair of compasses ✓**

> **Answer: D** — The compasses hold a fixed radius.
> - **A** — a protractor measures angles
> - **B** — a set square gives right angles
> - **C** — a ruler measures straight lengths

1.2 Which instrument measures the SIZE of an angle? (1)

A) compasses **B)** pencil

C) ruler **D) protractor ✓**

> **Answer: D** — A protractor is marked in degrees.
> - **A** — compasses draw arcs
> - **B** — a pencil marks the paper but measures nothing
> - **C** — a ruler measures length

1.3 To BISECT a line segment means to ... (1)

A) cut it into two equal parts ✓ **B)** measure it

C) draw it longer **D)** draw it at 90°

> **Answer: A** — Bi- means two.
> - **B** — measuring alone does not divide it
> - **C** — that is producing it
> - **D** — that is a perpendicular

1.4 The perpendicular bisector of AB ... (1)

A) is parallel to AB
B) passes through A only
C) cuts AB in half at 90° ✓
D) is longer than AB

> **Answer: C** — It does both jobs: bisects AND is perpendicular.
> - **A** — a parallel line would never cross it
> - **B** — it crosses the middle, not an endpoint
> - **D** — its length is not fixed

1.5 Before a triangle can be constructed from three given sides, the sides must satisfy ... (1)

A) one being a right angle
B) all being equal
C) the sum of any two being GREATER than the third ✓
D) all being different

> **Answer: C** — Otherwise the two shorter sides cannot meet.
> - **A** — a right angle is not required
> - **B** — equal sides make one particular triangle, not a rule
> - **D** — scalene is not required

1.6 Which set of lengths CANNOT form a triangle? (1)

A) 2 cm, 3 cm, 6 cm ✓
B) 5 cm, 5 cm, 5 cm
C) 3 cm, 4 cm, 5 cm
D) 6 cm, 8 cm, 10 cm

> **Answer: A** — $2 + 3 = 5$, which is less than 6, so the sides cannot close.
> - **B** — an equilateral triangle
> - **C** — $3 + 4 > 5$, so it works
> - **D** — $6 + 8 > 10$, so it works

1.7 A 60° angle can be constructed with compasses alone because it is the angle of ... (1)

A) a square
B) a hexagon's interior
C) a straight line
D) an equilateral triangle ✓

> **Answer: D** — Every angle of an equilateral triangle is 60°.
> - **A** — a square gives 90°
> - **B** — a regular hexagon's interior angle is 120°
> - **C** — a straight line gives 180°

1.8 The angles of ANY triangle add up to ... (1)

A) 180° ✓
B) 270°
C) 360°
D) 90°

> **Answer: A** — This is true for every triangle.
> - **B** — that is three right angles
> - **C** — that is a quadrilateral
> - **D** — that is one right angle

1.9 To construct a line parallel to a given line, you copy ... (1)

A) the midpoint
B) the corresponding angle ✓
C) the perpendicular
D) the length

> **Answer: B** — Equal corresponding angles guarantee parallel lines.
> - **A** — a midpoint does not fix direction
> - **C** — that constructs a perpendicular instead
> - **D** — length does not fix direction

1.10 Arcs drawn during a construction should be ... (1)

A) rubbed out afterwards
B) left showing ✓
C) drawn in pen
D) drawn freehand

> **Answer: B** — They are the evidence that the construction was done properly, and marks are awarded for them.
> - **A** — erasing them removes the evidence
> - **C** — constructions are drawn in pencil
> - **D** — compasses must be used, not freehand

ANSWER GRID — MARKING GUIDELINE

1.1	A	B	C	**(D)**
1.2	A	B	C	**(D)**
1.3	**(A)**	B	C	D
1.4	A	B	**(C)**	D
1.5	A	B	**(C)**	D
1.6	**(A)**	B	C	D
1.7	A	B	C	**(D)**
1.8	**(A)**	B	C	D
1.9	A	**(B)**	C	D
1.10	A	**(B)**	C	D

QUESTION 2 [11 MARKS]

Answer the following about constructions. You may use only a ruler and a pair of compasses, and you must leave all your construction arcs showing.

2.1 Describe, step by step, how you would construct the perpendicular bisector of a line segment AB. (4)

> Open the compasses to more than half of AB *(1)*
> With the point on A, draw arcs above and below AB *(1)*
> Keeping the SAME radius, repeat with the point on B *(1)*
> Join the two points where the arcs cross *(1)*

2.2 Explain why the compass radius must be MORE than half of AB. (3)

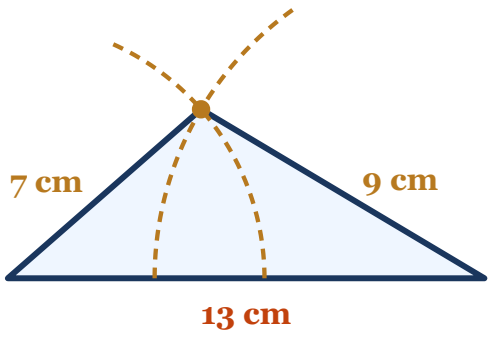
> If the radius is less than half of AB *(1)*
> the two sets of arcs never meet *(1)*
> so there are no crossing points to join *(1)*

2.3 Describe how you would construct an angle of $60°$ without using a protractor, and explain why the method works. **(4)**

> Draw a line and mark a point A on it *(1)*
> With centre A draw an arc cutting the line at B *(1)*
> With the SAME radius and centre B, draw an arc cutting the first at C; join AC *(1)*
> AB = BC = AC, so △ABC is equilateral and every angle is $60°$ *(1)*

QUESTION 3 [8 MARKS]

A learner is asked to construct a triangle with sides of 7 cm, 9 cm and 13 cm, as sketched below.



Sketch only — not to scale

3.1 Show by calculation that this triangle CAN be constructed. **(3)**

> $7 + 9 = 16$ *(1)*
> $16 > 13$ *(1)*
> The two shorter sides are longer than the third, so the arcs will meet *(1)*

3.2 A second learner is asked to construct a triangle with sides 5 cm, 6 cm and 12 cm. Explain why this is impossible. **(3)**

> $5 + 6 = 11$ *(1)*
> $11 < 12$ *(1)*
> The two shorter sides cannot reach each other, so the arcs never cross *(1)*

3.3 Write down the general rule you used in the two questions above. **(2)**

> The sum of any two sides of a triangle *(1)*
> must be greater than the third side *(the triangle inequality) (1)*

TOTAL: 29 marks

This question paper consists of 3 questions.

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