# 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** When two parallel lines are cut by a transversal, CO-INTERIOR angles are ... (1)

**A)** vertically opposite
**B) SUPPLEMENTARY ✓**
**C)** complementary
**D)** equal

**Answer: B** — Co-interior (allied) angles add up to 180°.

- **A** — vertically opposite angles are formed by crossing lines
- **C** — they add to 180°, not 90°
- **D** — that is true of alternate and corresponding angles

**1.2** ALTERNATE angles between parallel lines are ... (1)

**A)** complementary
**B)** supplementary
**C)** always right angles
**D) equal ✓**

**Answer: D** — They lie on opposite sides of the transversal and are equal.

- **A** — they would add to 90° only if each were 45°
- **B** — that is co-interior angles
- **C** — they can be any size

**1.3** CORRESPONDING angles between parallel lines are ... (1)

**A)** supplementary
**B) equal ✓**
**C)** unequal
**D)** complementary

**Answer: B** — They sit in matching positions at the two intersections.

- **A** — that is co-interior angles
- **C** — equal is precisely what they are
- **D** — they would add to 90°, which happens only if both are 45°

**1.4** Two parallel lines are cut by a transversal. One co-interior angle is $110°$. The other is ... (1)

**A)** $20°$ **B)** $250°$

**C) $70°$ ✓** **D)** $110°$

> **Answer: C** — $180° - 110° = 70°$.
> - **A** — used $90°$
> - **B** — used $360°$
> - **D** — treated co-interior angles as EQUAL — that is alternate angles

**1.5** Lines AB and CD are parallel. An alternate angle to one of $63°$ is ... (1)

**A) $63°$ ✓** **B)** $27°$

**C)** $117°$ **D)** $297°$

> **Answer: A** — Alternate angles are EQUAL.
> - **B** — that is the complement
> - **C** — that is the co-interior angle
> - **D** — that is the reflex angle

**1.6** Which pair of angles proves that two lines are PARALLEL? (1)

**A)** vertically opposite angles **B) equal corresponding angles ✓**

**C)** two angles that add to $90°$ **D)** two angles on a straight line

> **Answer: B** — Equal corresponding angles is the converse test for parallel lines.
> - **A** — those are equal at ANY crossing
> - **C** — complementary angles say nothing about parallel lines
> - **D** — that is true whether or not the lines are parallel

**1.7** In the letter Z between parallel lines, the two angles are ... (1)

**A)** co-interior **B)** supplementary

**C) alternate and EQUAL ✓** **D)** corresponding

> **Answer: C** — The Z shape is the classic picture of alternate angles.
> - **A** — co-interior angles make a C or U shape
> - **B** — alternate angles are equal, not supplementary
> - **D** — corresponding angles make an F shape

**1.8** Two parallel lines are cut by a transversal. If one angle is $90°$, then ... (1)

**A)** the lines are not really parallel **B)** only that angle is $90°$

**C)** four are $90°$ and four are $180°$ **D) ALL eight angles are $90°$ ✓**

> **Answer: D** — Every angle is either equal to it or supplementary to it, and $180° - 90° = 90°$.
> - **A** — a perpendicular transversal is perfectly possible
> - **B** — equal and supplementary angles are all $90°$ here
> - **C** — no angle at a crossing is $180°$

**1.9** Angles of $x$ and $(2x + 30)°$ are co-interior between parallel lines. Then $x = ...$ (1)

**A)** $50°$ ✓ **B)** $60°$

**C)** $70°$ **D)** $30°$

> **Answer: A** — $x + 2x + 30 = 180$ gives $3x = 150$.
>
> - **B** — divided $180$ by $3$
> - **C** — used $210$ instead of $150$
> - **D** — divided $90$ by $3$

**1.10** Which statement is TRUE for lines that are NOT parallel? (1)

**A)** co-interior angles still add to $180°$ **B)** corresponding angles are still equal

**C)** alternate angles are still equal **D)** **alternate angles need NOT be equal** ✓

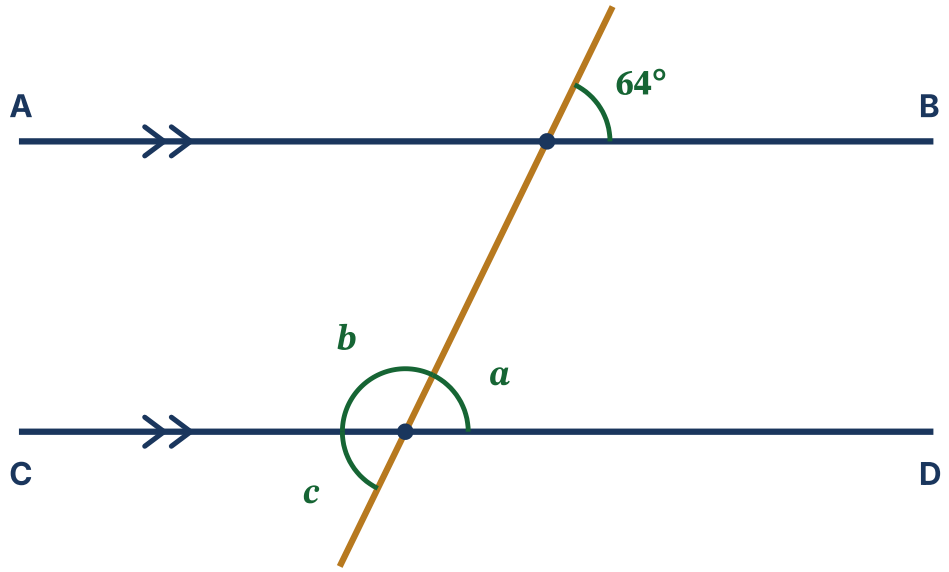
> **Answer: D** — All three of those properties require the lines to be parallel.
>
> - **A** — that needs parallel lines
> - **B** — that needs parallel lines
> - **C** — that needs parallel lines

**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 [10 MARKS]

In the diagram below, AB ∥ CD and a transversal cuts both lines. One angle of $64°$ is given. Determine, with a reason, the size of EACH of the angles $a$, $b$ and $c$. *The diagram is not drawn to scale.*




**2.1** The size of $a$. **(3)**

> $a = 64°$ *(1)*
> *corresponding angles (1)*
> *AB ∥ CD (1)*

**2.2** The size of $b$. **(3)**

> $b = 180° - 64°$ *(1)*
> $= \mathbf{116°}$ *(1)*
> *angles on a straight line (1)*

**2.3** The size of $c$. **(4)**

> $c = a$ *(1)*
> *vertically opposite angles (1)*
> $= \mathbf{64°}$ *(1)*
> (check: $b + c = 116° + 64° = 180°$) *(1)*

## QUESTION 3 [9 MARKS]

Answer the following.

**3.1** Two co-interior angles between a pair of parallel lines are $(2x + 20)°$ and $(3x - 10)°$. Calculate the value of $x$. **(3)**

> $(2x + 20) + (3x - 10) = 180$ *(co-interior angles are supplementary) (1)*
> $5x + 10 = 180$ *(1)*
> $x = \mathbf{34}$ *(1)*

**3.2** Hence determine the size of each of the two angles, and check your answer. **(3)**

> $2(34) + 20 = \mathbf{88°}$ *(1)*
> $3(34) - 10 = \mathbf{92°}$ *(1)*
> $88° + 92° = 180°$ ✓ *(1)*

**3.3** Two straight lines are cut by a transversal. A pair of alternate angles are both $75°$. State, with a reason, whether the two lines are parallel. **(3)**

> **Yes, the lines are parallel** *(1)*
> The alternate angles are equal *(1)*
> *(converse: if alternate angles are equal the lines are parallel)* *(1)*

**TOTAL: 29 marks**

*This question paper consists of 3 questions.*

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