MARKING GUIDELINE

MARKS	DURATION	QUESTIONS
31	50 minutes	3

Name: _____ Class: _____

Date: _____

MARK ____ / 31

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 one of the following is NOT a condition for congruency? (1)

A) RHS **B)** SSS

C) SAS **D) AAA ✓**

> **Answer: D** — AAA fixes the SHAPE but not the size, so it proves similarity only.
>
> - **A** — right angle, hypotenuse and one side fix it
> - **B** — three equal sides fix the triangle
> - **C** — two sides and the included angle fix it

1.2 △ABC ≡ △DEF means the two triangles are ... (1)

A) equal in area only **B)** similar only

C) the same shape AND the same size ✓ **D)** the same shape only

> **Answer: C** — The symbol ≡ means congruent.
>
> - **A** — equal areas do not force the same shape
> - **B** — similar allows different sizes
> - **D** — that is similarity

1.3 Which of the following is enough to prove that two triangles are SIMILAR? (1)

A) two pairs of sides in the same ratio
B) two pairs of equal angles ✓
C) one pair of equal sides
D) one pair of equal angles

> **Answer: B** — If two pairs of angles are equal, the third pair is equal too (the angles of a triangle add up to $180°$), so the triangles are equiangular — and equiangular triangles are similar.
>
> - **A** — two ratios are not enough — ALL three pairs of sides must be in the same ratio
> - **C** — one pair of sides says nothing about the shape
> - **D** — one angle leaves the other two free to change

1.4 In $\triangle ABC \equiv \triangle PQR$, the angle equal to $\hat{B}$ is ... (1)

A) $\hat{R}$
B) $\hat{P}$
C) $\hat{A}$
D) $\hat{Q}$ ✓

> **Answer: D** — The letters correspond in order: A↔P, B↔Q, C↔R.
>
> - **A** — R matches C
> - **B** — P matches A
> - **C** — A is in the first triangle

1.5 Two triangles have equal hypotenuses and one other pair of equal sides, and both are right-angled. They are congruent by ... (1)

A) RHS ✓
B) SAS
C) SSS
D) AAA

> **Answer: A** — Right angle, Hypotenuse, Side.
>
> - **B** — the right angle is not INCLUDED between the two known sides
> - **C** — only two sides are known
> - **D** — no angles other than the right angle are given

1.6 Equiangular triangles are always ... (1)

A) right-angled
B) the same size
C) similar ✓
D) congruent

> **Answer: C** — Equal angles fix the shape but not the size.
>
> - **A** — nothing forces a right angle
> - **B** — the sizes may differ
> - **D** — congruency needs equal sides as well

1.7 $\triangle ABC \,|||\, \triangle DEF$ with $AB = 8$, $DE = 4$ and $BC = 10$. Then $EF =$ ... (1)

A) 20
B) 5 ✓
C) 10
D) $2{,}5$

> **Answer: B** — The factor from ABC to DEF is $\frac{1}{2}$, so $EF = 10 \div 2$.
>
> - **A** — multiplied instead of dividing
> - **C** — similar triangles have equal sides only if the factor is 1
> - **D** — divided by 4 instead of 2

1.8 In similar triangles, corresponding SIDES are ... (1)

A) equal
B) in the same ratio ✓
C) perpendicular
D) supplementary

> **Answer: B** — That constant ratio is the scale factor.
> - **A** — equal sides would make them congruent
> - **C** — sides need not meet at right angles
> - **D** — sides are not angles

1.9 Which pair of triangles must be congruent? (1)

A) both with the same area
B) both with angles $30°$, $60°$, $90°$
C) both with sides 3, 4, 5 ✓
D) both right-angled

> **Answer: C** — Three equal sides fix the triangle completely (SSS).
> - **A** — different shapes can have the same area
> - **B** — equal angles fix the shape, not the size
> - **D** — a right angle alone fixes nothing

1.10 A photograph is enlarged by a factor of 4. Its PERIMETER is multiplied by ... (1)

A) 4 ✓
B) 8
C) 16
D) 2

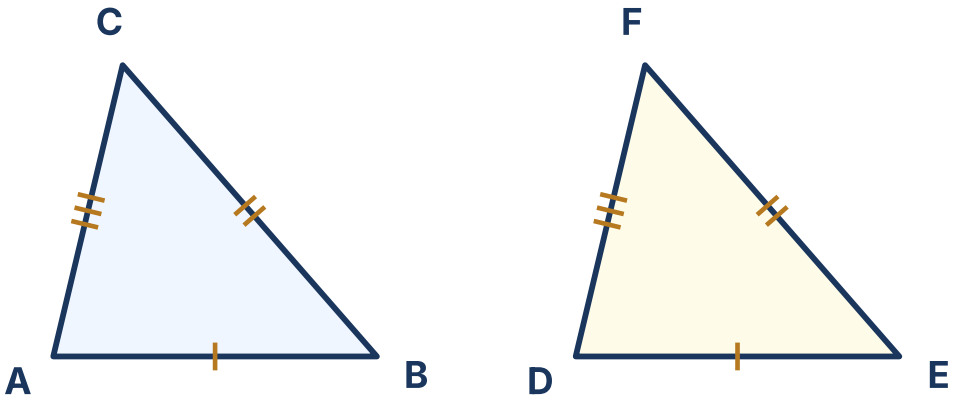
> **Answer: A** — Perimeter is a LENGTH, so it scales by the length factor.
> - **B** — 4 doubled is not the scale factor
> - **C** — that is the AREA factor
> - **D** — that is the square root of the factor

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]

Study the two triangles in the diagram below. *The diagrams are not drawn to scale.*



matching ticks show equal sides

2.1 Write down the condition of congruency that proves △ABC ≡ △DEF, and explain why that condition is enough. **(4)**

> **SSS** *(2)*
> All THREE pairs of corresponding sides are equal *(1)*
> and equal sides force the angles between them to be equal too *(1)*

2.2 Explain why the ORDER of the letters matters when you write △ABC ≡ △DEF. **(3)**

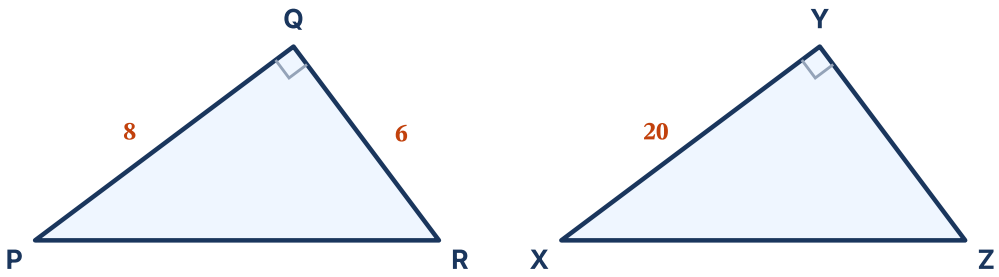
> The order shows which vertex corresponds to which *(1)*
> A matches D, B matches E and C matches F *(1)*
> so writing △ABC ≡ △EDF would claim the wrong pairs are equal *(1)*

2.3 A learner claims that AAA proves two triangles congruent. Explain why the learner is wrong, and state what AAA DOES prove. **(4)**

> Equal angles fix only the SHAPE of a triangle, not its size *(2)*
> An enlargement has the same three angles but longer sides *(1)*
> AAA proves the triangles are **similar**, not congruent *(1)*

QUESTION 3 [10 MARKS]

△PQR and △XYZ are similar. PQ = 8 cm, QR = 6 cm and XY = 20 cm. △PQR is right-angled at Q.



△PQR △XYZ

3.1 Calculate the scale factor from △PQR to △XYZ. **(3)**

$k = \frac{20}{8}$ *(2)*
$= \mathbf{2,5}$ *(1)*

3.2 Hence calculate the length of YZ. **(3)**

YZ = QR × k = 6 × 2,5 *(2)*
= **15 cm** *(1)*

3.3 Calculate the length of PR, and hence the length of XZ. **(4)**

$PR^2 = 8^2 + 6^2 = 100$ *(Pythagoras) (1)*
PR = **10 cm** *(1)*
XZ = 10 × 2,5 *(1)*
= **25 cm** *(1)*

TOTAL: 31 marks

This question paper consists of 3 questions.

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