



ACHIEVE ACADEMY

GCSE Maths — Higher Tier

Congruence & Similarity · Practice Booklet

NAME: _____

CLASS: _____

DATE: _____

☐ Developing

☐ Secure

☐ Greater Depth

Answer every question in the working space provided. Method marks are available for correct working even if the final answer is wrong. Check the time allowed with your tutor before you start.

Congruence & Similarity

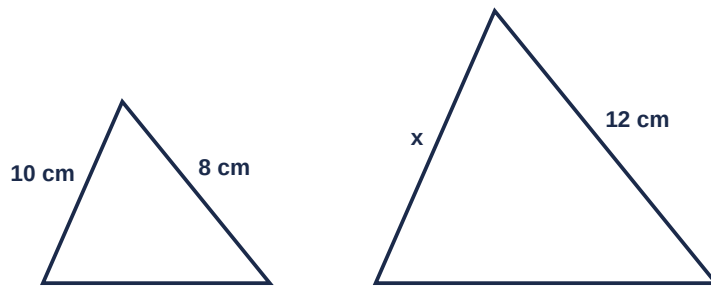
Total marks available: 100

Congruence & Similarity

Q1

[3 marks]

Triangle ABC is similar to triangle PQR. Corresponding lengths 8 cm and 12 cm are marked. Use the scale factor to find the length marked x .



(diagrams not drawn to scale)

A large dashed rectangular box for the student's answer.

Q2

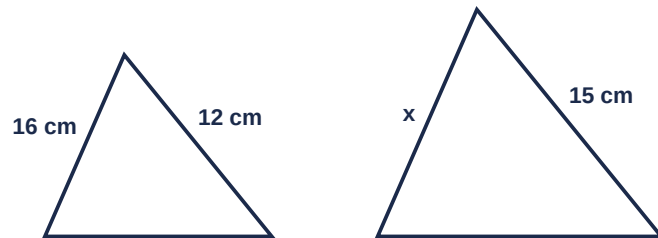
[3 marks]

ABCD is a parallelogram with diagonal AC. Using $AB = CD$ and $BC = AD$ (opposite sides of a parallelogram are equal), and the shared side AC, which condition proves triangle ABC is congruent to triangle CDA?

Q3

[3 marks]

Triangle ABC is similar to triangle PQR. Corresponding lengths 12 cm and 15 cm are marked. Use the scale factor to find the length marked x.



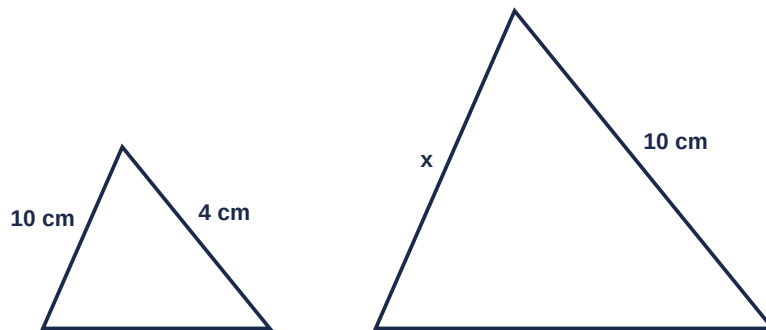
(diagrams not drawn to scale)

A large dashed rectangular box for the student's answer.

Q4

[3 marks]

Triangle ABC is similar to triangle PQR. Corresponding lengths 4 cm and 10 cm are marked. Use the scale factor to find the length marked x .



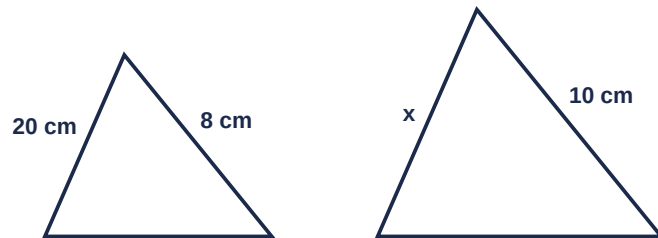
(diagrams not drawn to scale)

A large dashed rectangular box for the student's answer.

Q5

[3 marks]

Triangle ABC is similar to triangle PQR. Corresponding lengths 8 cm and 10 cm are marked. Use the scale factor to find the length marked x.



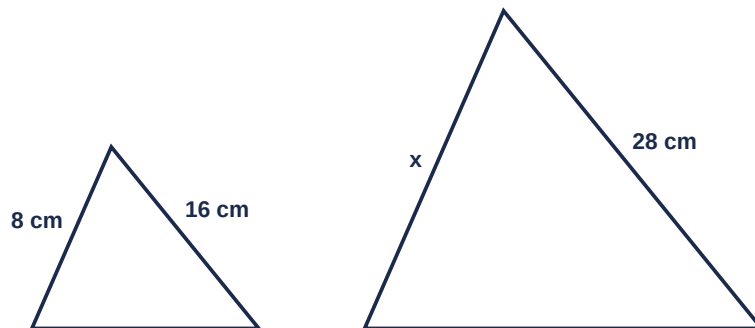
(diagrams not drawn to scale)

A large dashed rectangular box for writing the answer.

Q6

[3 marks]

Triangle ABC is similar to triangle PQR. Corresponding lengths 16 cm and 28 cm are marked. Use the scale factor to find the length marked x .



(diagrams not drawn to scale)

A large dashed rectangular box for the student's answer.

Q7

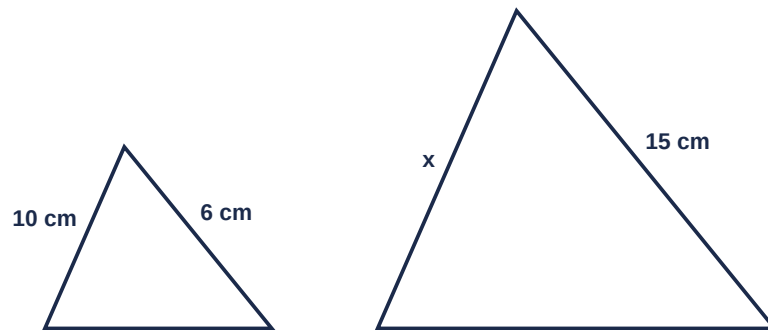
[3 marks]

ABCD is a rectangle with diagonal BD. Using the right angles at A and C, the shared hypotenuse BD, and $AB = CD$ (opposite sides of a rectangle are equal), which condition proves triangle ABD is congruent to triangle CDB?

Q8

[3 marks]

Triangle ABC is similar to triangle PQR. Corresponding lengths 6 cm and 15 cm are marked. Use the scale factor to find the length marked x .



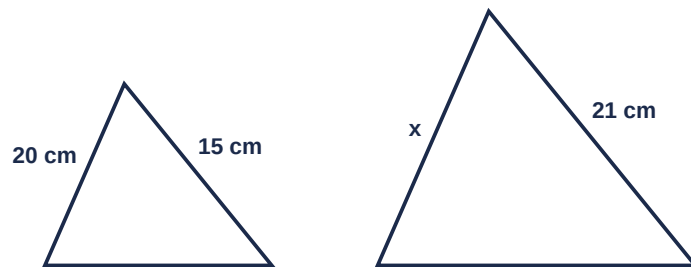
(diagrams not drawn to scale)

A large dashed rectangular box for the student to show their working.

Q9

[3 marks]

Triangle ABC is similar to triangle PQR. Corresponding lengths 15 cm and 21 cm are marked. Use the scale factor to find the length marked x .



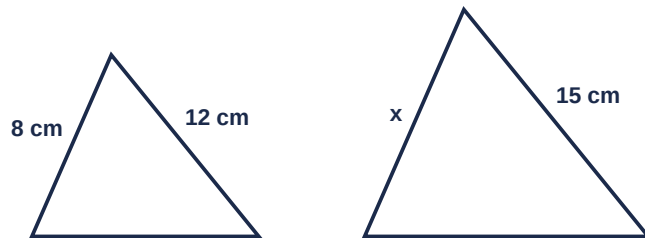
(diagrams not drawn to scale)

A large dashed rectangular box for the student's answer.

Q10

[3 marks]

Triangle ABC is similar to triangle PQR. Corresponding lengths 12 cm and 15 cm are marked. Use the scale factor to find the length marked x.



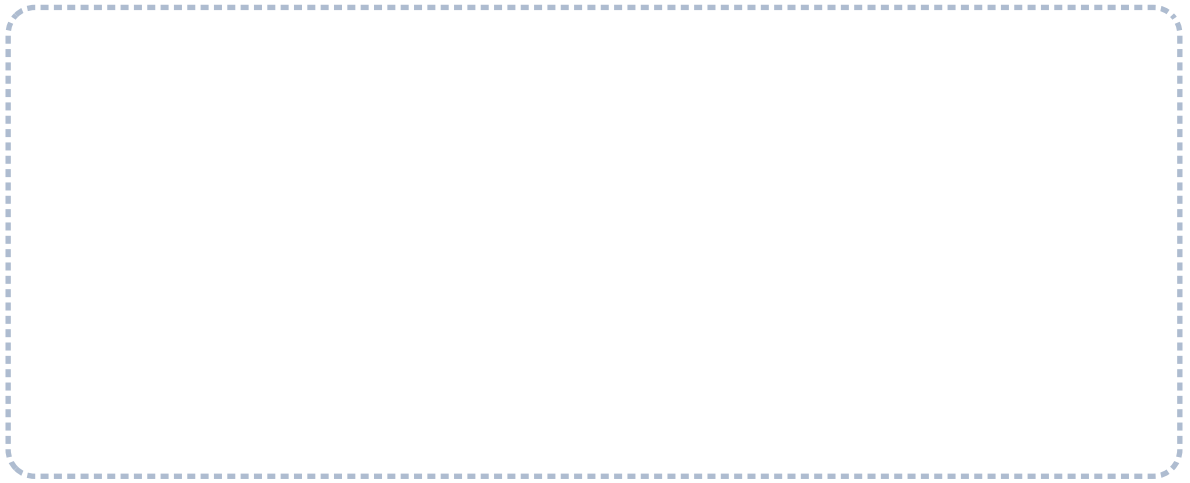
(diagrams not drawn to scale)

A large dashed rectangular box for the student to show their working.

Q11

[3 marks]

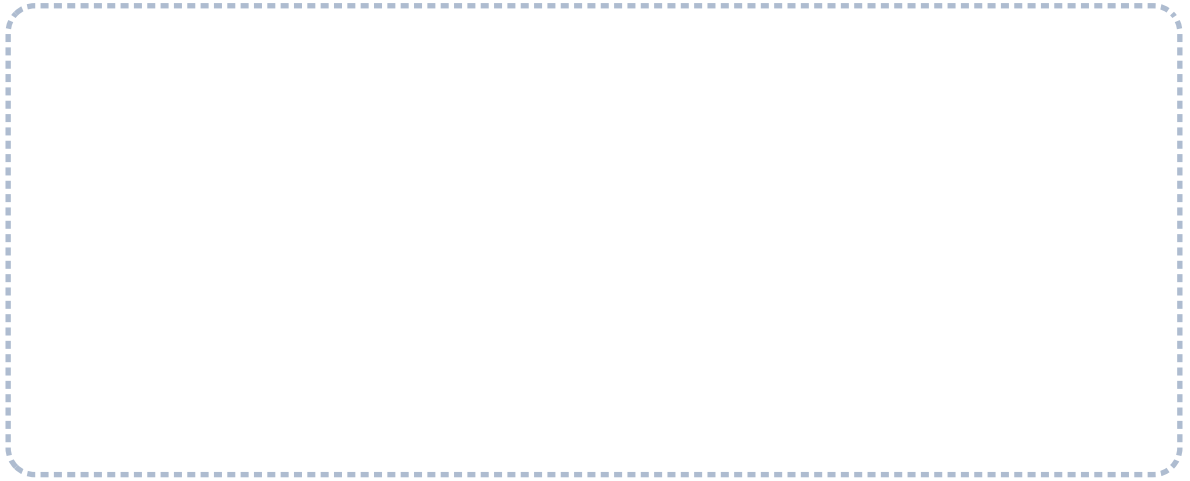
Two similar shapes have linear scale factor 2.5. The larger shape has area 150 cm^2 . Find the area of the smaller shape.



Q12

[3 marks]

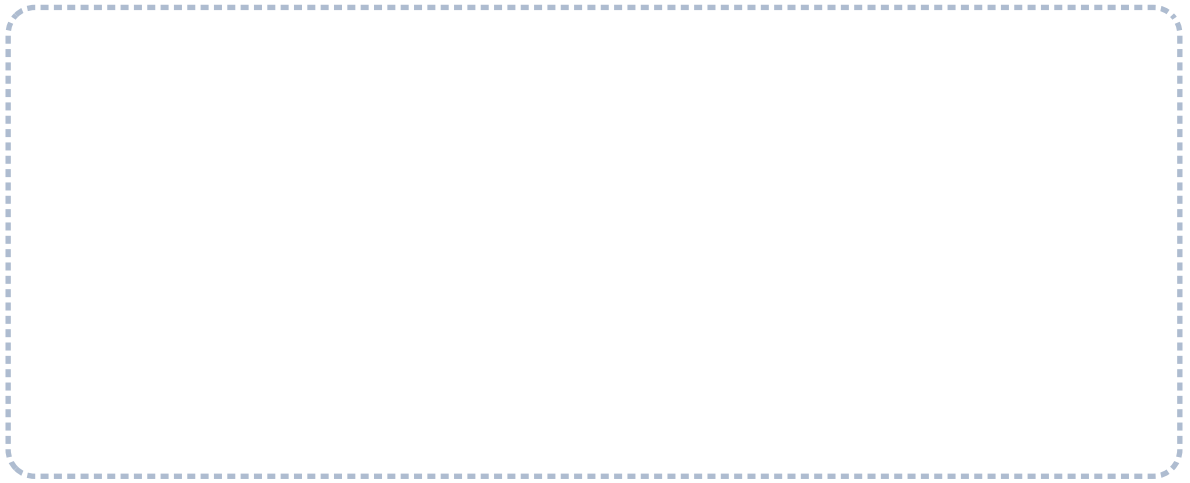
Two similar solids have linear scale factor 1.8. The smaller solid has volume 125 cm^3 . Find the volume of the larger solid.



Q13

[3 marks]

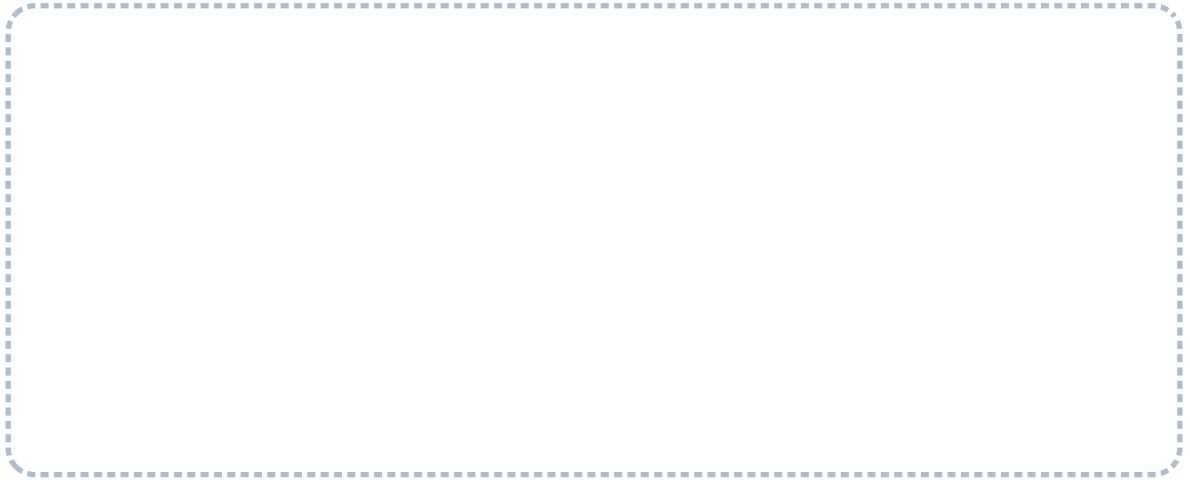
Two similar solids have linear scale factor 1.8. The larger solid has volume 729 cm^3 . Find the volume of the smaller solid.



Q14

[3 marks]

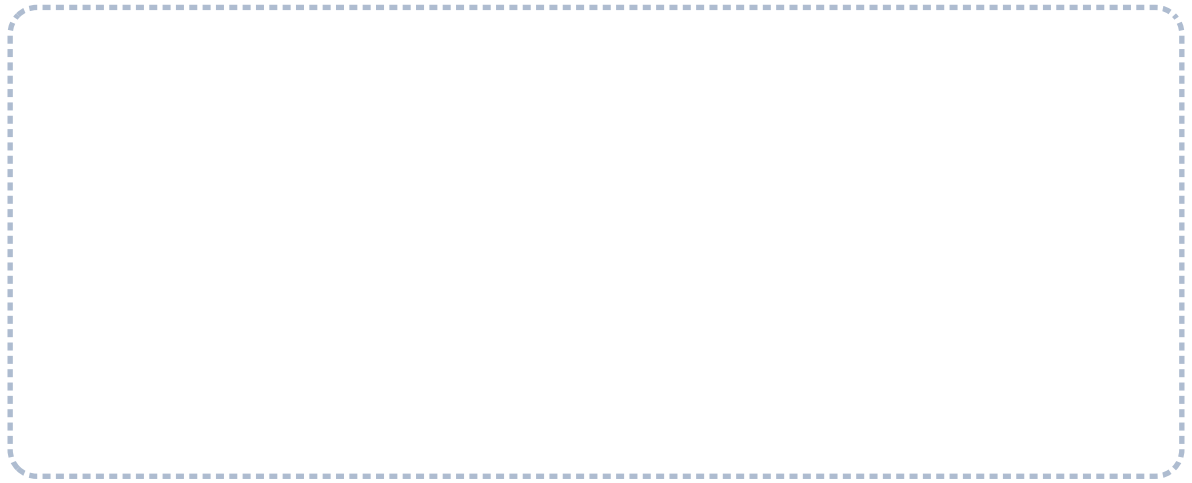
Two similar solids have linear scale factor 1.5. The smaller solid has volume 32 cm^3 . Find the volume of the larger solid.



Q15

[3 marks]

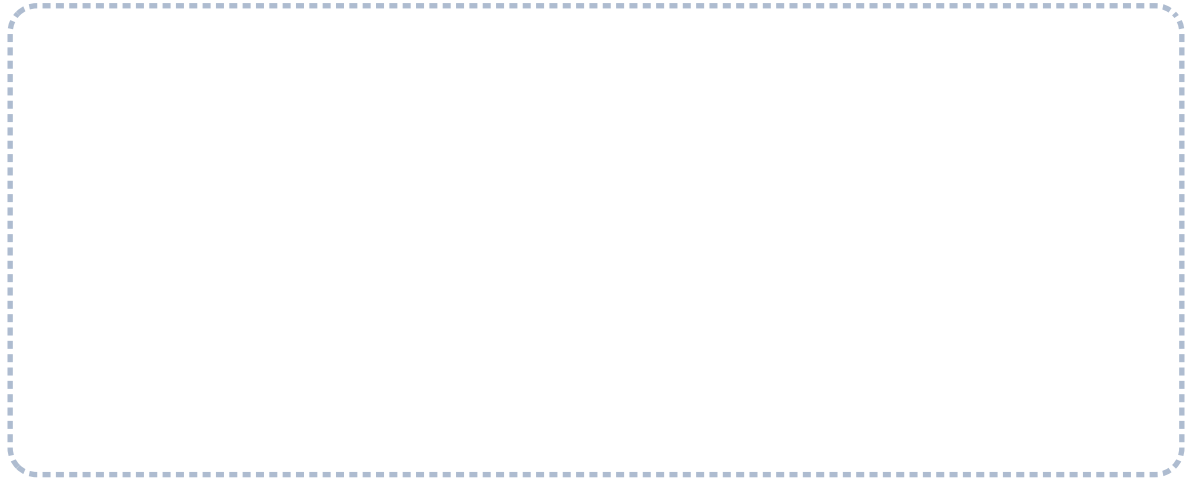
Two similar solids have linear scale factor 1.75. The smaller solid has volume 64 cm^3 . Find the volume of the larger solid.



Q16

[3 marks]

Two similar shapes have linear scale factor 1.75. The larger shape has area 196 cm^2 . Find the area of the smaller shape.



Q17

[3 marks]

Two similar solids have linear scale factor 1.75. The larger solid has volume 686 cm^3 . Find the volume of the smaller solid.

Q18

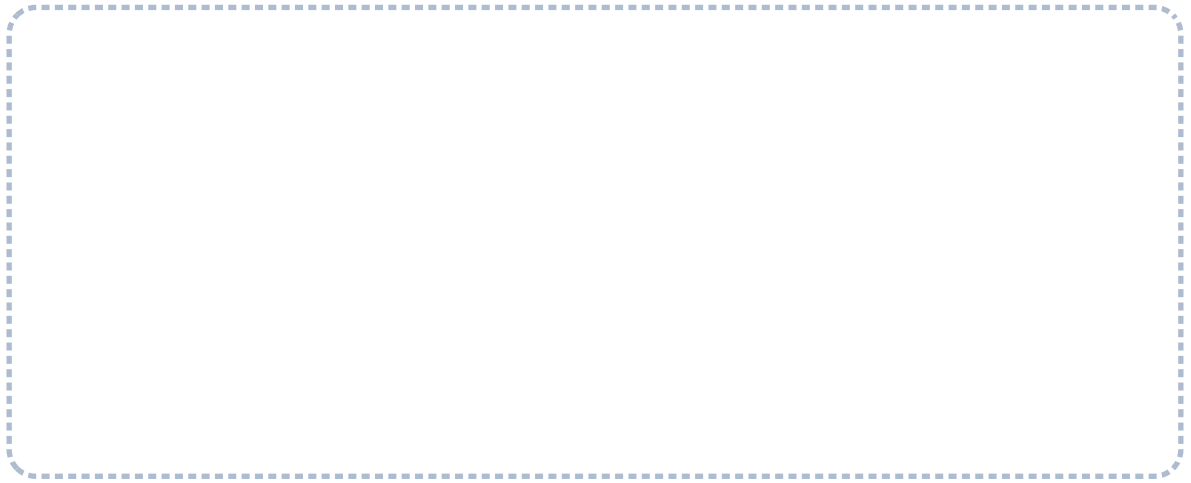
[3 marks]

Two similar solids have linear scale factor 1.25. The smaller solid has volume 192 cm^3 . Find the volume of the larger solid.

Q19

[3 marks]

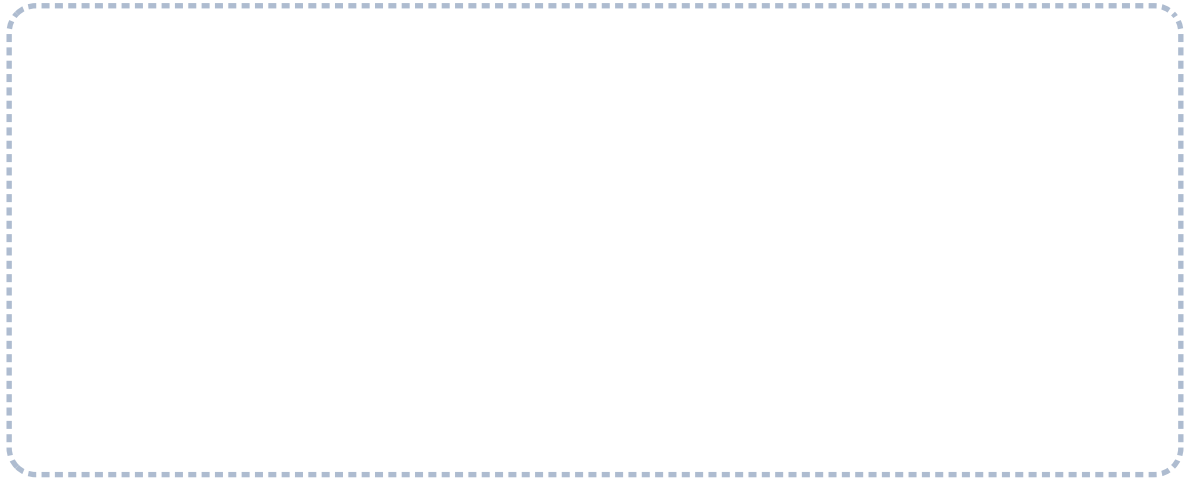
Two similar shapes have linear scale factor 1.4. The smaller shape has area 75 cm^2 . Find the area of the larger shape.



Q20

[3 marks]

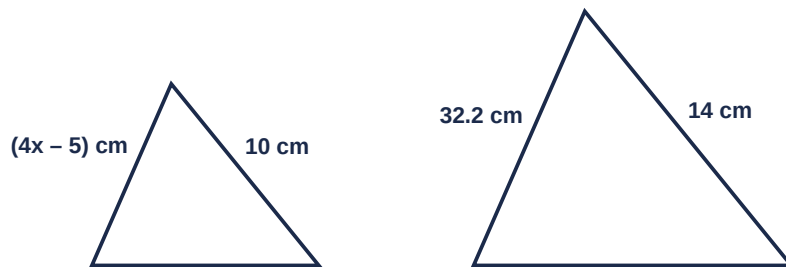
Two similar solids have linear scale factor 1.4. The larger solid has volume 343 cm^3 . Find the volume of the smaller solid.



Q21

[4 marks]

Triangle ABC is similar to triangle PQR, with scale factor $14 \div 10$. Side AC = $(4x - 5)$ cm and the corresponding side PR = 32.2 cm. Find the value of x , and the length of AC.



(diagrams not drawn to scale)

A large dashed rectangular box for the student's answer.

Q22

[4 marks]

In parallelogram ABCD, diagonal BD is drawn. AB is parallel to DC, so angle ABD = angle BDC (alternate angles). AD is parallel to BC, so angle ADB = angle DBC (alternate angles). Triangles ABD and CDB share the side BD. Which condition proves triangle ABD is congruent to triangle CDB?

Q23

[4 marks]

In isosceles triangle ABC, $AB = AC$. The bisector of angle BAC meets BC at M, so angle BAM = angle CAM. Triangles ABM and ACM share the side AM. Using $AB = AC$, angle BAM = angle CAM, and the shared side AM, which condition proves triangle ABM is congruent to triangle ACM?

Q24

[4 marks]

Triangle ABC is similar to triangle PQR, with scale factor $14 \div 10$. Side AC = $(2x - 6)$ cm and the corresponding side PR = 16.8 cm. Find the value of x , and the length of AC.



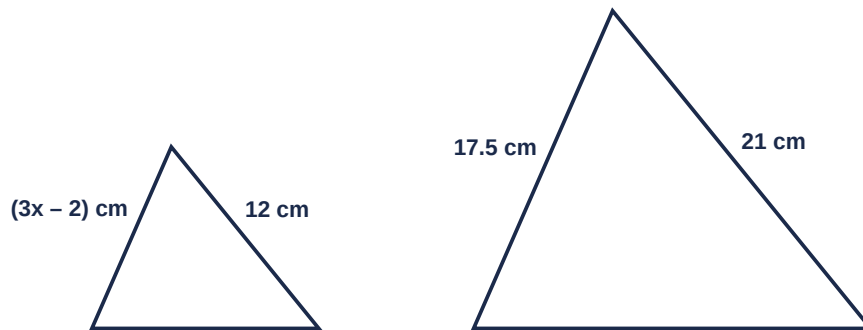
(diagrams not drawn to scale)

A large dashed rectangular box for the student's answer.

Q25

[4 marks]

Triangle ABC is similar to triangle PQR, with scale factor $21 \div 12$. Side AC = $(3x - 2)$ cm and the corresponding side PR = 17.5 cm. Find the value of x , and the length of AC.



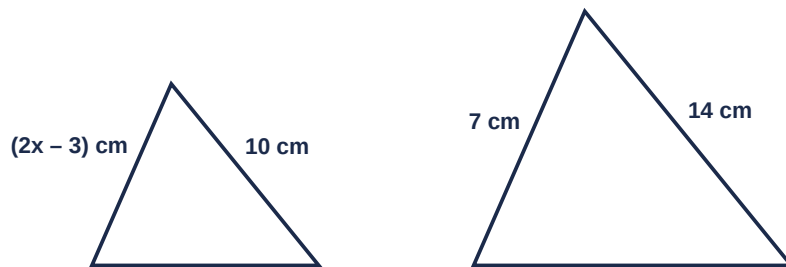
(diagrams not drawn to scale)

A large dashed rectangular box for the student's answer.

Q26

[4 marks]

Triangle ABC is similar to triangle PQR, with scale factor $14 \div 10$. Side AC = $(2x - 3)$ cm and the corresponding side PR = 7 cm. Find the value of x , and the length of AC.



(diagrams not drawn to scale)

A large dashed rectangular box for the student's answer.

Q27

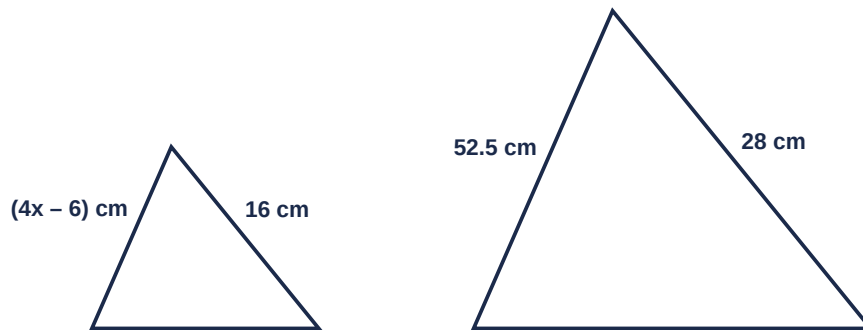
[4 marks]

Two right-angled triangles, ABC and PQR, each have a right angle (at B and at Q). Their hypotenuses AC and PR are equal, and side AB = side PQ. Which condition proves triangle ABC is congruent to triangle PQR?

Q28

[4 marks]

Triangle ABC is similar to triangle PQR, with scale factor $28 \div 16$. Side AC = $(4x - 6)$ cm and the corresponding side PR = 52.5 cm. Find the value of x , and the length of AC.



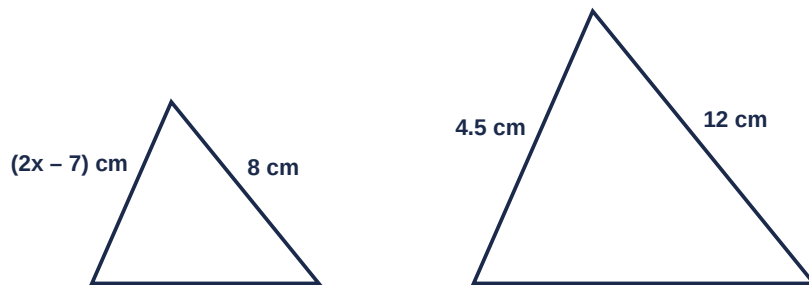
(diagrams not drawn to scale)

A large dashed rectangular box for the student's answer.

Q29

[4 marks]

Triangle ABC is similar to triangle PQR, with scale factor $12 \div 8$. Side AC = $(2x - 7)$ cm and the corresponding side PR = 4.5 cm. Find the value of x , and the length of AC.



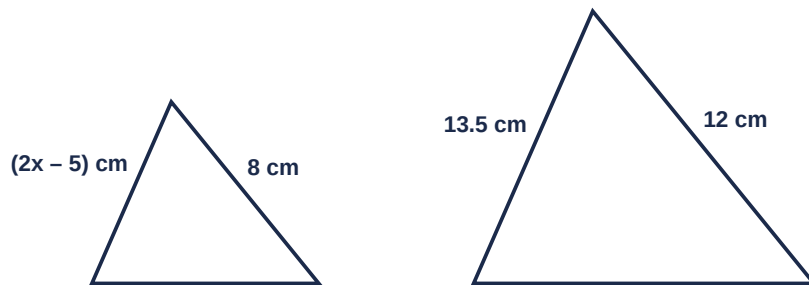
(diagrams not drawn to scale)

A large dashed rectangular box for the student's answer.

Q30

[4 marks]

Triangle ABC is similar to triangle PQR, with scale factor $12 \div 8$. Side AC = $(2x - 5)$ cm and the corresponding side PR = 13.5 cm. Find the value of x , and the length of AC.



(diagrams not drawn to scale)

A large dashed rectangular box for the student's answer.