

WJEC MATHEMATICS

**HIGHER**

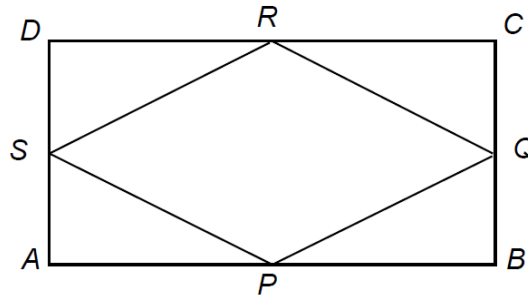
3 TIER TOPICS

**CONGRUENCE AND SIMILAR  
SHAPES**

**@MrGoreMaths.**

Spec 1 – Maths – P2

11.  $ABCD$  is a rectangle.  $P$ ,  $Q$ ,  $R$  and  $S$  are the mid-points of the sides.



(a) Prove that triangles  $APS$  and  $CRQ$  are congruent. [3]

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(b) Use your proof in part (a) to decide what is the special name given to the quadrilateral  $PQRS$ . Give your reason. [1]

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Spec 2 – Maths – P1

11. A metal bar can be melted down to form 875 solid ornaments of height 6.3 cm.  
How many similar ornaments of height 31.5 cm could have been formed from the same metal bar?

[4]

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Spec 2 – Maths – P2

2. Circle either TRUE or FALSE for each statement given below.

[2]

STATEMENT		
Circles with diameters of equal length are congruent.	TRUE	FALSE
Regular pentagons whose perimeters are of equal length are congruent.	TRUE	FALSE
Scalene triangles that have the same three angles are congruent.	TRUE	FALSE
Rectangles with equal areas are congruent.	TRUE	FALSE

Nov 2016 – Maths – P1

16. Triangle  $ABC$  is an isosceles triangle with  $\hat{ABC} = \hat{ACB}$ .

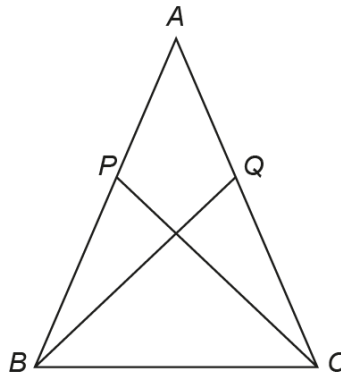


Diagram not drawn to scale

$P$  and  $Q$  are points on  $AB$  and  $AC$  respectively such that  $AP = AQ$ .

Prove that triangle  $ABQ$  is congruent to triangle  $ACP$ .  
You must give reasons for each step of your proof.

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Nov 2016 – Maths – P2

17. Two similar shapes have areas of  $700\text{ cm}^2$  and  $140\text{ cm}^2$ .  
The perimeter of the smaller shape is 83 cm.  
Calculate the perimeter of the larger shape.

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June 2017 – Maths – P1

14. SSS, SAS, ASA and RHS are notations used to describe the conditions required to prove that two triangles are congruent.  
[S ≡ Side, A ≡ Angle, R ≡ Right angle and H ≡ Hypotenuse.]

The following triangles are **not** drawn to scale.  
For each pair of triangles, circle the correct statement.

(a)



[1]

- congruent: SSS    congruent: SAS    congruent: ASA    congruent: RHS    definitely not congruent    not necessarily congruent

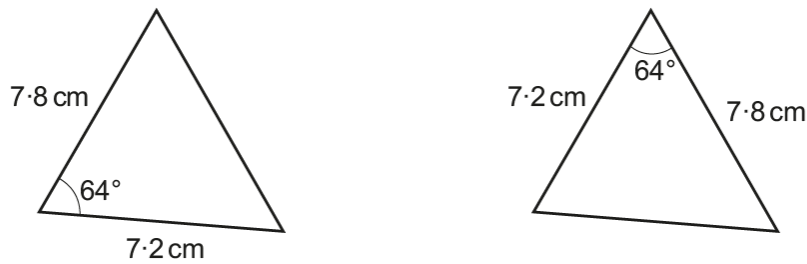
(b)



[1]

- congruent: SSS    congruent: SAS    congruent: ASA    congruent: RHS    definitely not congruent    not necessarily congruent

(c)



[1]

- congruent: SSS    congruent: SAS    congruent: ASA    congruent: RHS    definitely not congruent    not necessarily congruent



Spec 2 – Numeracy – P2

14. A solid concrete base for a garden statue is to be made in the shape of a *frustum* of a pyramid. The *frustum* is formed by removing a small pyramid from a large pyramid, as shown in the diagram.

Calculate the volume of concrete required to make the base for the garden statue. Give your answer in **litres**.

[6]

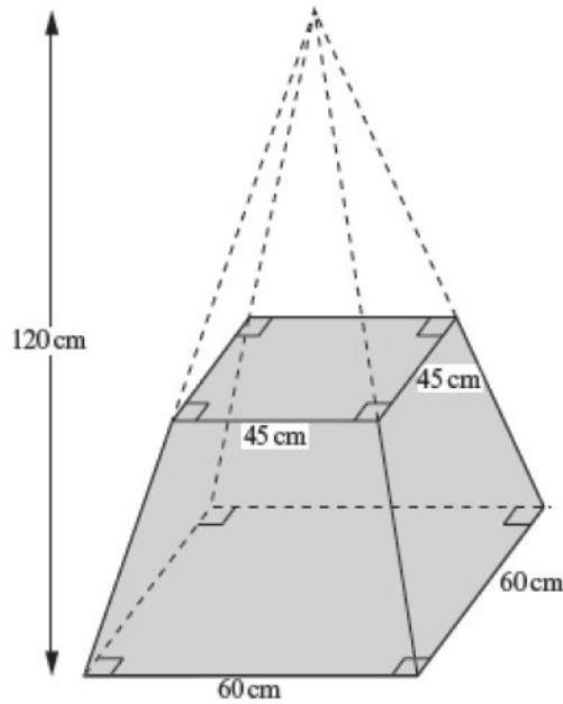


Diagram not drawn to scale

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Nov 2016 – Numeracy – P2

- (b) The Headteacher decides to place signs around the school site to stop pupils using their bikes on grassed areas.

He introduces a new sign to pupils in the school newsletter.  
The size of the sign in the newsletter is shown below.

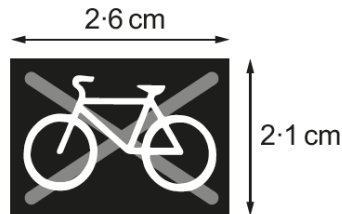


Diagram not drawn to scale

A mathematically similar new sign is placed near the side of the playing field.



Diagram not drawn to scale

It is 33.6 cm high.  
How wide is this sign?

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Width is ..... cm

June 2017 – Numeracy – P2

13. The front views of two mathematically similar milk cartons are shown below.

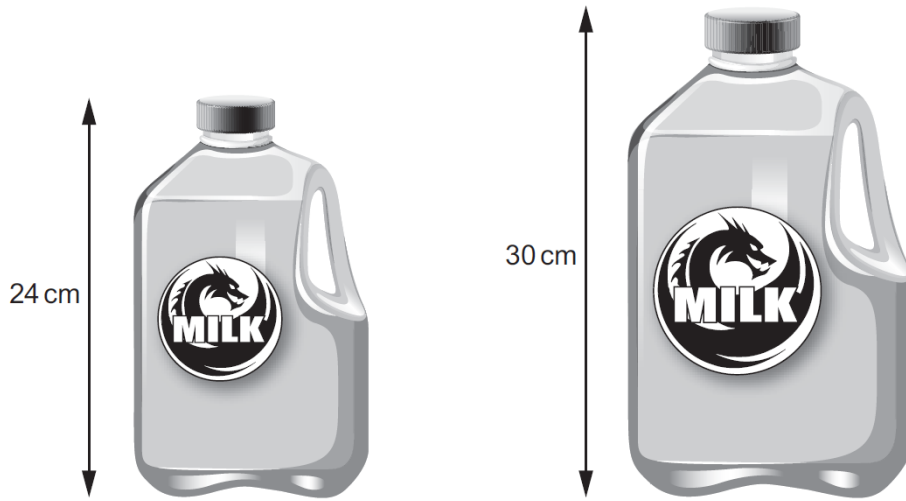


Diagram not drawn to scale

(a) Circle either TRUE or FALSE for each statement given below. [1]

STATEMENT		
The ratio of the lengths of the cartons is the same as the ratio of the heights of the cartons.	TRUE	FALSE
The ratio of the volumes of the cartons is the same as the ratio of the heights of the cartons.	TRUE	FALSE

(b) It is claimed that the larger carton contains double the amount of milk contained in the smaller carton.  
Show that this claim is not true.  
Explain your answer. [3]

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- (c) Another similar milk carton has a label with an area that is one quarter of the area of the label on the carton of height 24 cm.



Diagram not drawn to scale

Calculate the height of this new carton.

[3]

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