




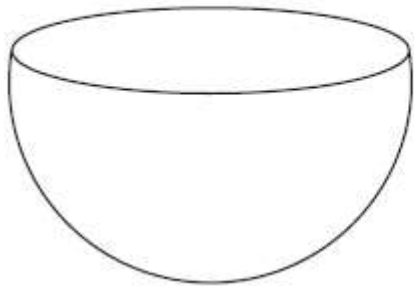
# JustMaths

Countdown to your final Maths exam ...  
Part 4(2019)

## "WORKING ABOVE"

	Marks	Actual	  
Q1. Surface area of a hemisphere	4		
Q2. Describe a transformation	4		
Q3. Volume of a frustum	4		
Q4. Factorise and solve a quadratic	3		
Q5. Volume of a prism	4		
Q6. Area of a trapezium / surds	3		
Q7. Metric unit conversion	2		
Q8. Volume of a prism	3		
Q9. Expression for area	4		
Q10. Complete the square/ minimum points	4		
Q11. Transformations	3		
Q12. Derive an equation for area of a trapezium	5		
Q13. Surface area of a prism	3		
Q14. Area of a trapezium	4		
Q15. 3D Trig/ Volume	4		

Q1. The diagram shows a solid hemisphere.



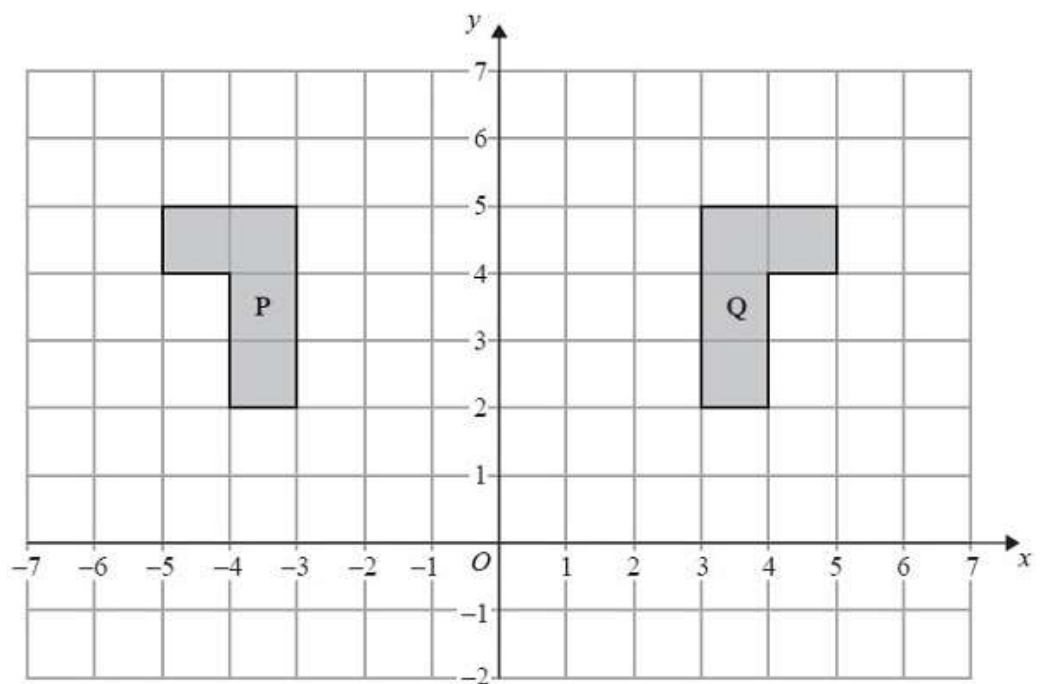
Volume of sphere =  $\frac{4}{3}\pi r^3$   
Surface area of sphere =  $4\pi r^2$

The volume of the hemisphere is  $\frac{250}{3}\pi$

Work out the exact total surface area of the solid hemisphere.  
Give your answer as a multiple of  $\pi$ .

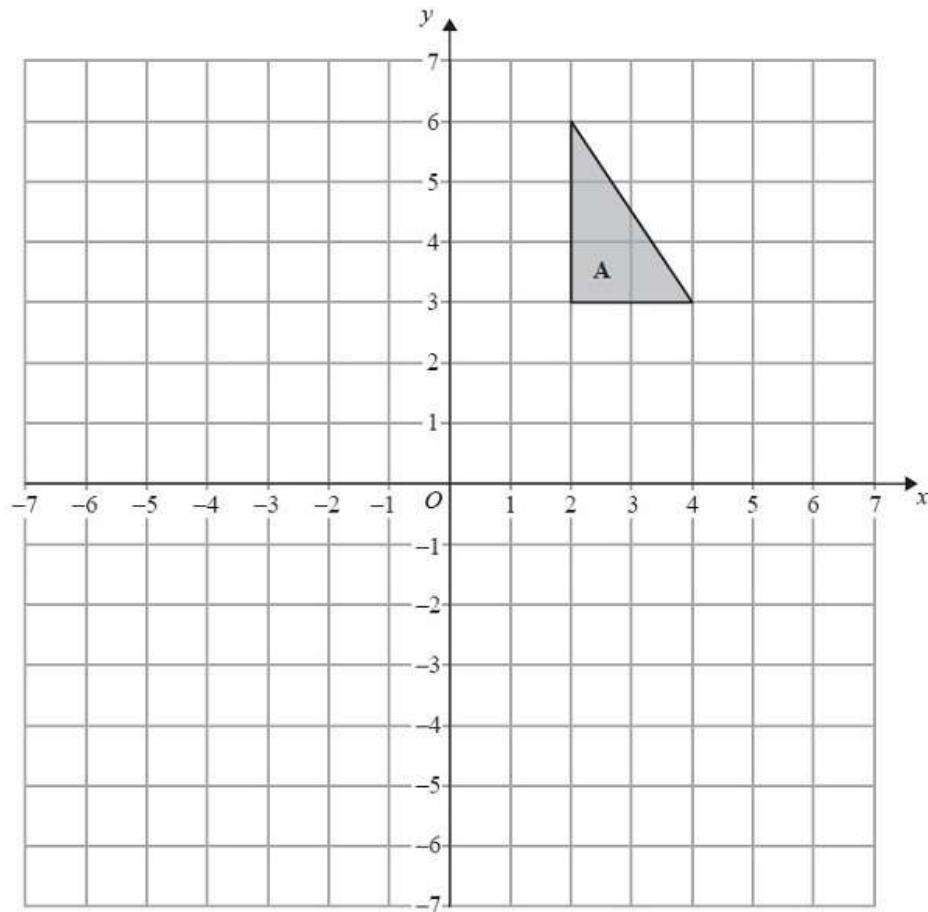
(4)

Q2. Two shapes are shown on the grid.



(a) Describe fully the single transformation that maps shape P onto shape Q.

(2)



(b) Rotate triangle A  $90^\circ$  clockwise about the point  $(0, 2)$ .  
Label the new triangle B.

(2)

Q3. A frustrum is made by removing a small cone from a similar large cone.

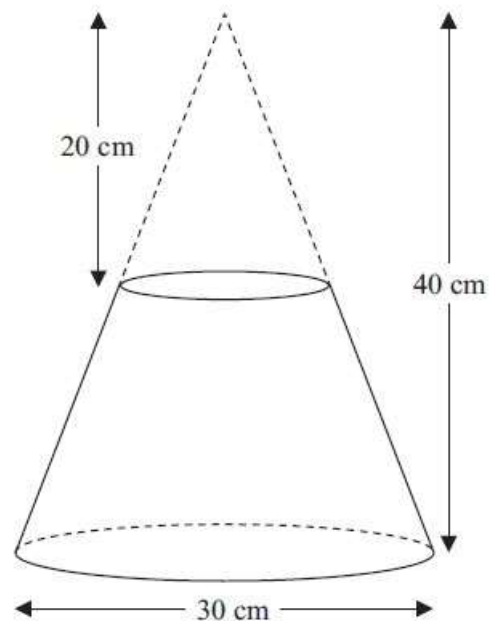
The height of the small cone is 20 cm.

The height of the large cone is 40 cm.

The diameter of the base of the large cone is 30 cm.

Work out the volume of the frustrum.

Give your answer correct to 3 significant figures.



(4)

Q4. Solve, by factorising, the equation  $8x^2 - 30x - 27 = 0$

(3)

Q5. Here is a solid prism.

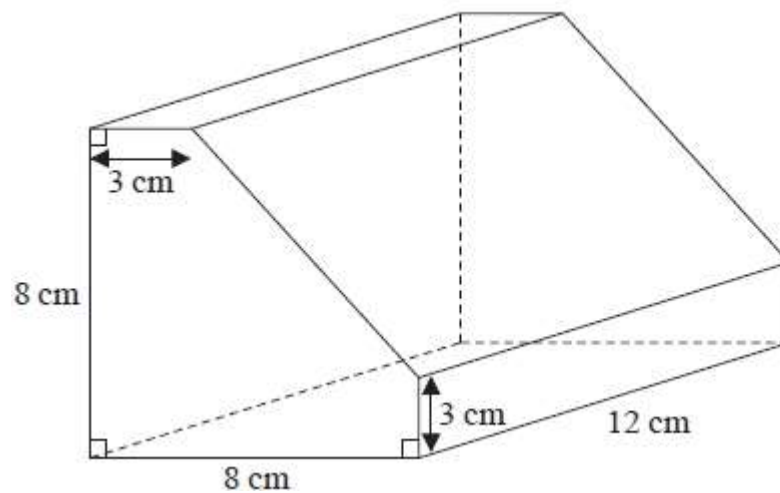


Diagram NOT accurately drawn

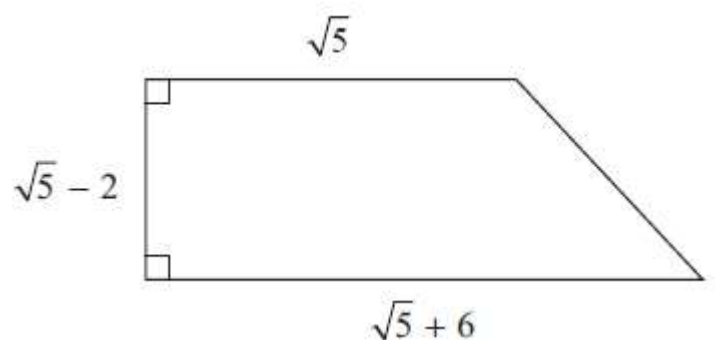
Work out the volume of the prism. You must show all your working.

(4)

Q6. Here is a trapezium.

All measurements shown are in centimetres.

Work out the area of the trapezium.  
Give your answer in  $\text{cm}^2$  in the form  $a\sqrt{5} + b$   
where  $a$  and  $b$  are integers.



Q7. Change  $2 \text{ m}^3$  to  $\text{cm}^3$ .

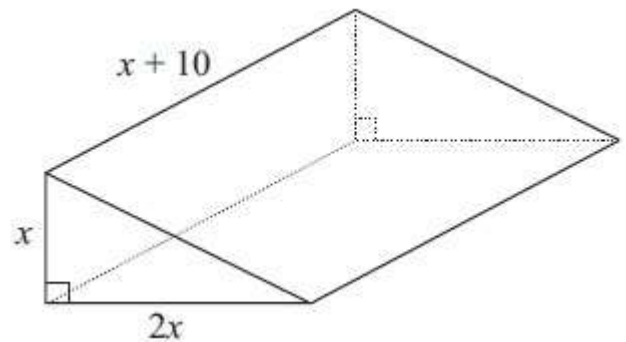
(3)

Q8.

The diagram shows a solid triangular prism.  
All the measurements are in centimetres.

The volume of the prism is  $V \text{ cm}^3$ .

Find a formula for  $V$  in terms of  $x$ .  
Give your answer in simplified form.

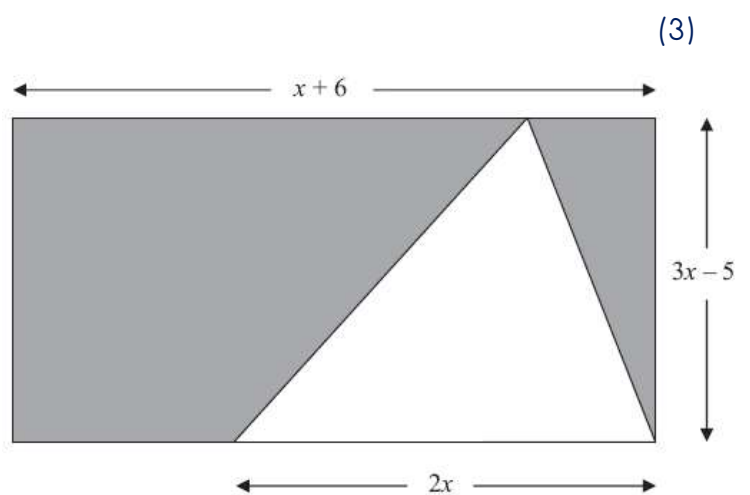


(2)

Q9. The diagram shows a triangle inside a rectangle.

All measurements are given in centimetres.

Show that the total area, in  $\text{cm}^2$ , of the shaded regions is  $18x - 30$



(3)

(4)

Q10. The expression  $x^2 - 8x + 6$  can be written in the form  $(x - p)^2 + q$  for all values of  $x$ .

(a) Find the value of  $p$  and the value of  $q$ .

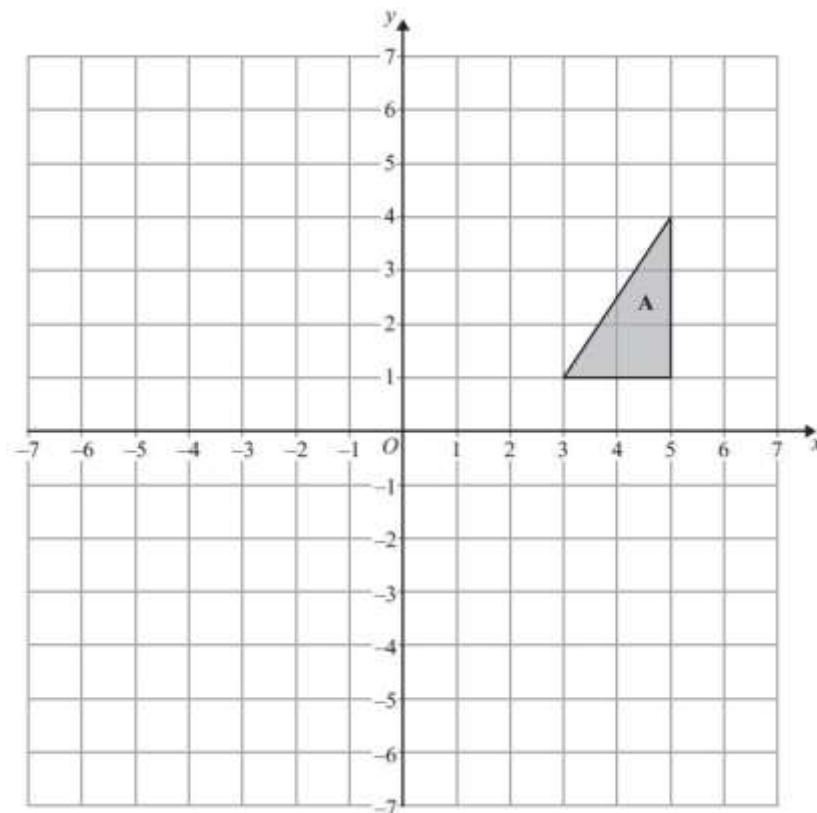
(3)

The graph of  $y = x^2 - 8x + 6$  has a minimum point.

(b) Write down the coordinates of this point.

(1)

Q11.



Triangle A is reflected in the  $x$ -axis to give triangle B.

Triangle B is then reflected in the line  $x = 1$  to give triangle C.

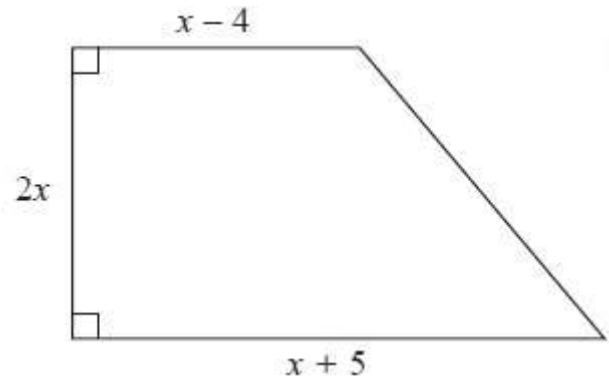
Describe fully the single transformation that maps triangle A onto triangle C.

(3)

Q12. The diagram shows a trapezium.

All the measurements are in centimetres. The area of the trapezium is  $351 \text{ cm}^2$ .

(a) Show that  $2x^2 + x - 351 = 0$



(2)

(b) Work out the value of  $x$ .

(3)

Q13. Frances grows plants in a container.

Each of the 5 faces of the container is made of glass.

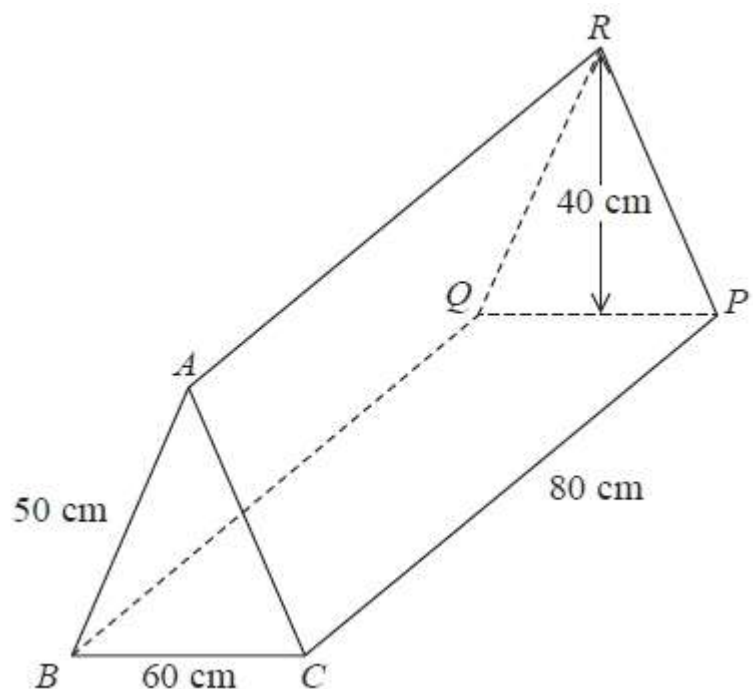
The container is in the shape of a prism. The cross section of the prism is an isosceles triangle with height 40 cm.

$$BC = 60 \text{ cm}$$

$$AB = AC = 50 \text{ cm}$$

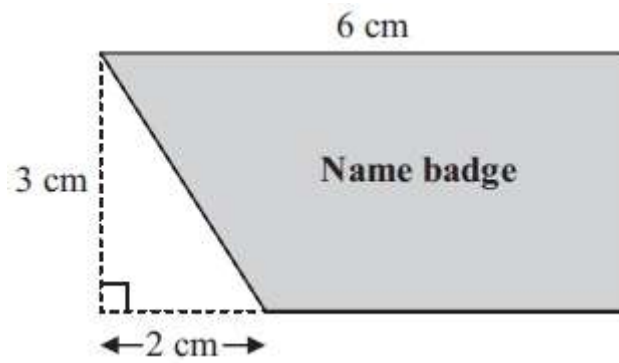
$$CP = 80 \text{ cm}$$

Work out the total area of glass needed to make the container.



(3)

Q14. Janice cuts a triangle from a rectangular piece of metal. She uses the rest of the metal to make a name badge.

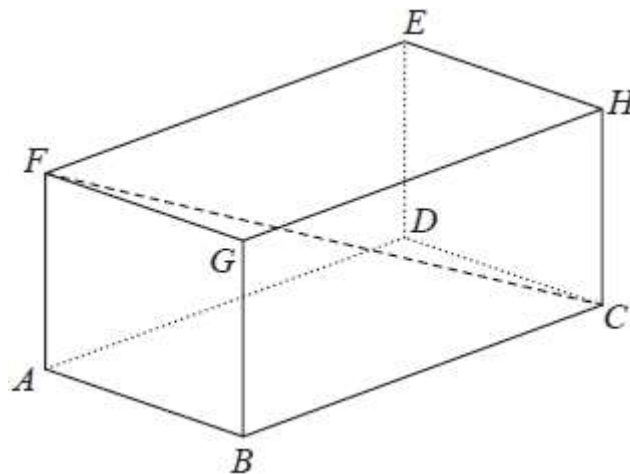


The rectangle has length 6 cm and width 3 cm.  
The right-angled triangle has base 2 cm and height 3 cm.

Work out the area of the name badge.

(4)

Q15. The diagram shows a cuboid  $ABCDEFGH$ .



$AB = 7$  cm,  $AF = 5$  cm and  $FC = 15$  cm.

Calculate the volume of the cuboid.  
Give your answer correct to 3 significant figures.

(4)