GCSE Grade 7

Maths Booklet 5

Paper 1H
Non-Calculator

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1 In a shop, all normal prices are reduced by 20% to give the sale price.

The sale price of a TV set is then reduced by 30%.

Mary says,

> "30 + 20 = 50, so this means that the normal price of the TV set has been reduced by 50%."

Is Mary right?
You must give a reason for your answer.

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(Total for Question 1 is 2 marks)

2 Factorise fully $20x^2 - 5$

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(Total for Question 2 is 2 marks)

3 Make a the subject of $a + 3 = \dfrac{2a + 7}{r}$

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(Total for Question 3 is 3 marks)

4 Solid **A** and solid **B** are mathematically similar.
The ratio of the surface area of solid **A** to the surface area of solid **B** is 4 : 9

The volume of solid **B** is 405 cm^3.

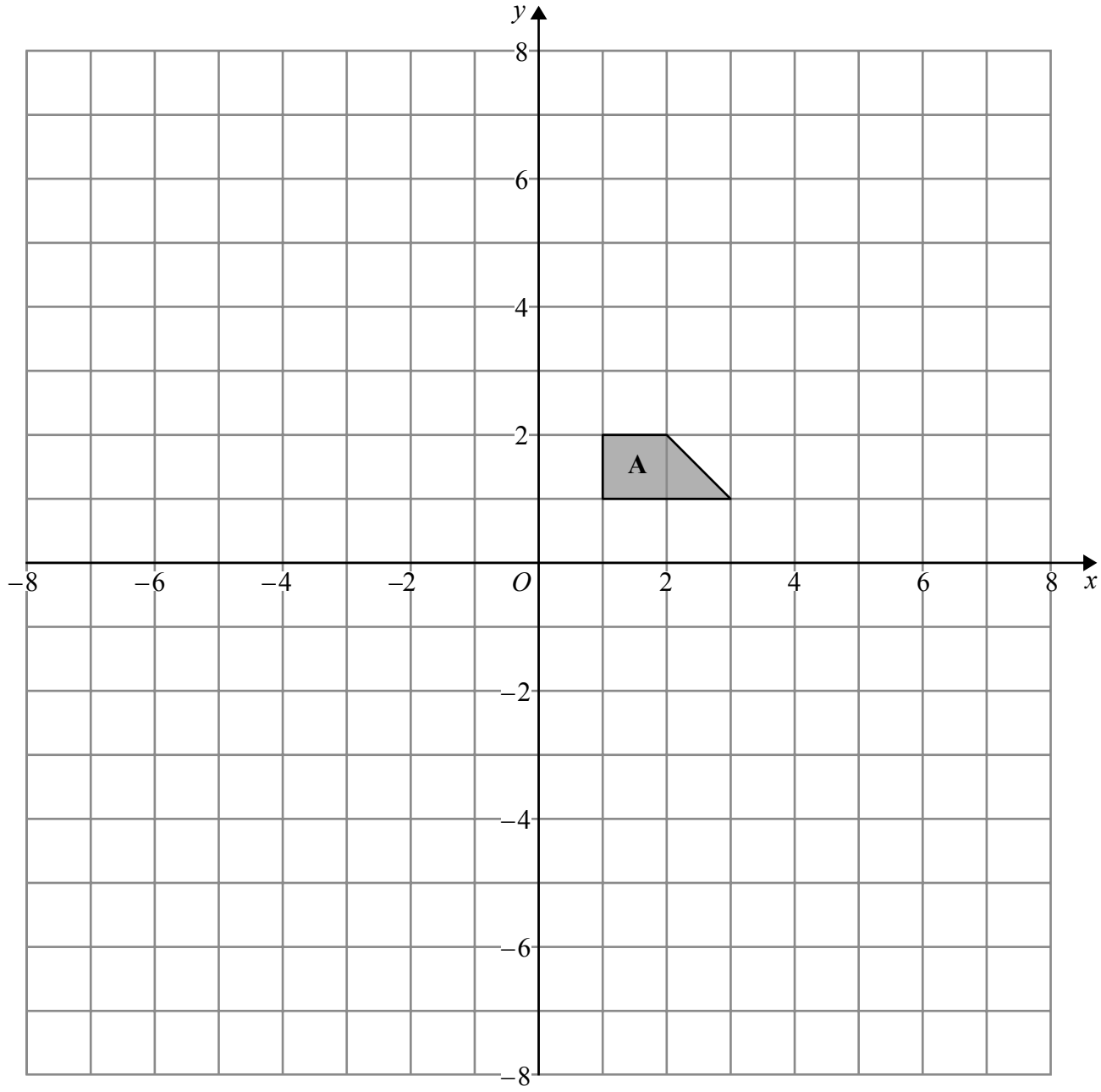
Show that the volume of solid **A** is 120 cm^3.

(Total for Question 4 is 3 marks)

5 Solve $x^2 > 3x + 4$

(Total for Question 5 is 3 marks)

6



(a) Enlarge shape **A** by scale factor −2, centre (0, 0)
Label your image **B**.

(2)

(b) Describe fully the single transformation that will map shape **B** onto shape **A**.

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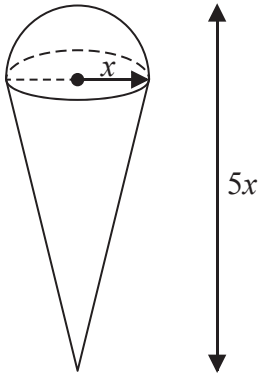
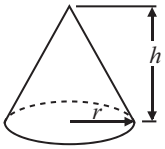
(1)

(Total for Question 6 is 3 marks)

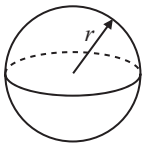
7 A solid is made by putting a hemisphere on top of a cone.



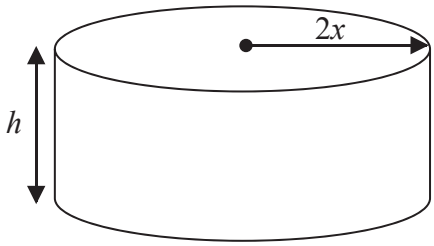
Volume of cone = $\frac{1}{3}\pi r^2 h$



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



The total height of the solid is $5x$
The radius of the base of the cone is x
The radius of the hemisphere is x



A cylinder has the same volume as the solid.
The cylinder has radius $2x$ and height h
All measurements are in centimetres.

Find a formula for h in terms of x
Give your answer in its simplest form.

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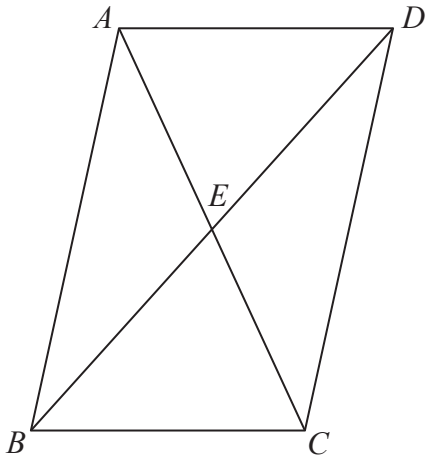
(Total for Question 7 is 5 marks)

8 *ABCD* is a parallelogram.



E is the point where the diagonals *AC* and *BD* meet.

Prove that triangle *ABE* is congruent to triangle *CDE*.

(Total for Question 8 is 3 marks)

9 Mr Brown gives his class a test.
The 10 girls in the class get a mean mark of 70%
The 15 boys in the class get a mean mark of 80%

Nick says that because the mean of 70 and 80 is 75 then the mean mark for the whole class in the test is 75%

Nick is not correct.
Is the correct mean mark less than or greater than 75%?
You must justify your answer.

(Total for Question 9 is 2 marks)

10 Show that $\frac{\left(4-\sqrt{3}\right)\left(4+\sqrt{3}\right)}{\sqrt{13}}$ simplifies to $\sqrt{13}$

(Total for Question 10 is 2 marks)