

Year 11 Higher Maths Practice Paper 2

This paper covers: Ratio and proportion, Area and volume, Transformations.

TIME ALLOWED

45 minutes

TOTAL MARKS

39

QUESTIONS

26

Name _____

Class _____ Date _____

INSTRUCTIONS

- Use black ink or a black ball-point pen.
- Answer every question in the space given.
- You may use a calculator.
- Show your working. Some marks are given for a correct method, even when the answer is wrong.

INFORMATION

- The marks for each question are shown in brackets, for example [1 mark].
- The questions start easier and get harder as you go.
- Diagrams are not drawn accurately unless the question says so.
- Check your answers if you have time at the end.

FOR THE MARKER

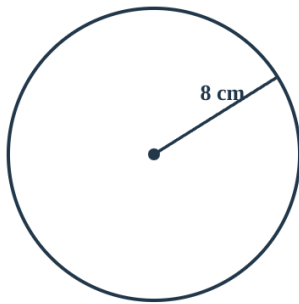
Score _____ out of 39

Percentage _____ %

01 Questions

Answer every question. Show your working.

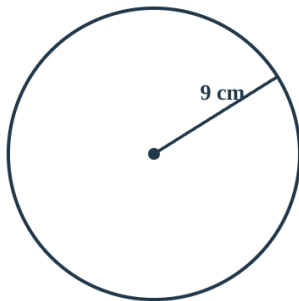
- 1** The measurements of this sphere are given: it has a radius of 8 centimetres. What is the radius cubed, in square centimetres? [1 mark]



a sphere of this radius

ANSWER

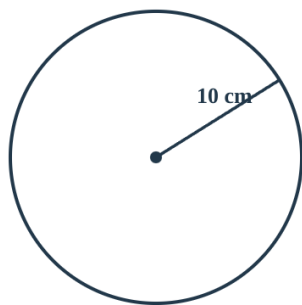
- 2** A sphere has a radius of 9 centimetres. What is its volume, to one decimal place? [1 mark]



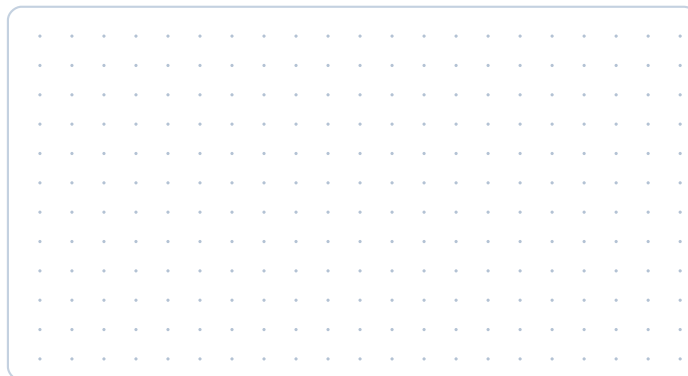
a sphere of this radius

ANSWER

- 3 This sphere has a radius of 10 centimetres. What is the area of the circle through its centre, to one decimal place? [1 mark]



a sphere of this radius



ANSWER

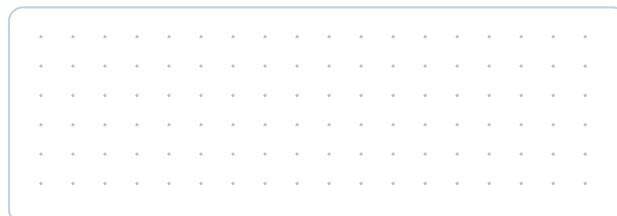
- 4 Work out the surface area of this cone, which has a base radius of 9 centimetres and a slant height of 15 centimetres. Give your answer to one decimal place. [1 mark]



The solid

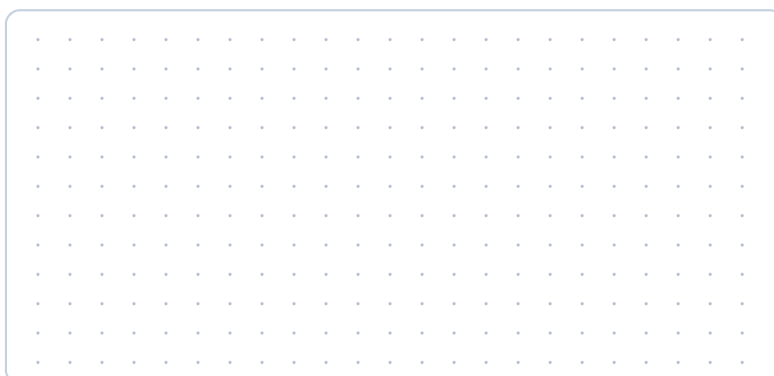
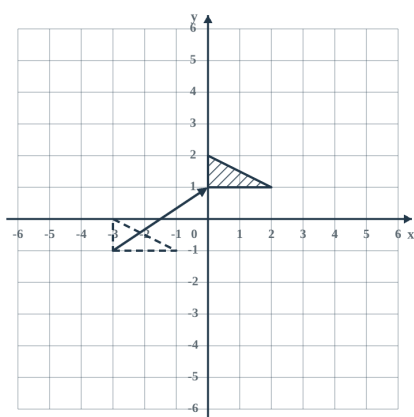


Its net



ANSWER

- 5 The shape has slid to its new position. How many squares to the right has it moved? [1 mark]



ANSWER

- 6 A cone of radius 3 centimetres and height 4 centimetres has its top cut off half way up. What is the volume of the piece that is left, to one decimal place? [2 marks]

ANSWER

- 7 Work out the volume of a sphere that has a radius of 10 centimetres. Give your answer to one decimal place. [2 marks]

ANSWER

- 8 A sphere has a volume of 3053.6 cubic centimetres. What is the volume of a hemisphere of the same radius, to one decimal place? [2 marks]

ANSWER

- 9 Silver and gold are mixed in the ratio 5 : 3. Cut the bar with silver on the left. Draw the line that cuts the bar. [1 mark]

5 : 3

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- 10 Match each measurement to the rule that gives it. Draw a line from each item on the left to its match on the right. [1 mark]

the volume of a cone	•	• $\pi \times \text{radius}^2 \times \text{height}$
the volume of a cylinder	•	• $4 \times \pi \times \text{radius}^2$
the surface of a sphere	•	• $\pi \times \text{radius}^2 \times \text{height} \div 3$

- 11 Match each solid to the parts that make up its surface. Draw a line from each item on the left to its match on the right. [1 mark]

sphere	•	• the six rectangular faces added, in three matching pairs
cuboid	•	• $4 \times \pi \times \text{radius}^2$
triangular prism	•	• the two triangular ends added to the three rectangular faces

- 12 A slide can turn a shape upside down. Is that true or false? Circle your answer. [1 mark]
- ☐ True ☐ False

- 13 Omar and Cara share 56 ml in the ratio 4 : 3. How much does Omar get? [2 marks]

ANSWER

- 14 Grace says 4 cm^2 is 40 mm^2 because there are 10 mm in a cm. What is 4 cm^2 in square millimetres? Circle your answer. [1 mark]

☐ 4,000 ☐ 400 ☐ 40

- 15 Two friends share money in the ratio 1 : 2, and one gets £3 more than the other. Isla divides £3 by 3 to find one part. What is wrong? Circle your answer. [1 mark]

☐ Nothing, that gives one part ☐ The difference is 1 part, so divide by 1
☐ The difference should be multiplied by 3

- 16** A lampshade is a cut-off cone with radii of 12 centimetres and 6 centimetres and a slant height of 10 centimetres. What is the area of material in its curved surface, to one decimal place? [3 marks]

ANSWER

- 17** A cone has a volume of 130.9 cubic centimetres and a base radius of 5 centimetres. What is its height, to the nearest centimetre? [2 marks]

ANSWER

- 18** A box is 2 cm by 4 cm by 10 cm. What is its volume in cubic metres? [2 marks]

ANSWER

- 19** Mo casts a square-based pyramid in metal. It has a square base of side 9 centimetres and a perpendicular height of 9 centimetres. One cubic centimetre of the metal has a mass of 8 grams. What is the mass of the casting, to the nearest gram? [2 marks]

ANSWER

- 20** A shape slides 1 right and 1 up, then 1 left and 1 up. Which single slide takes it from start to finish? Circle your answer. [1 mark]

☐ 1 right and 1 up

☐ 2 up only

☐ 2 right and 2 up

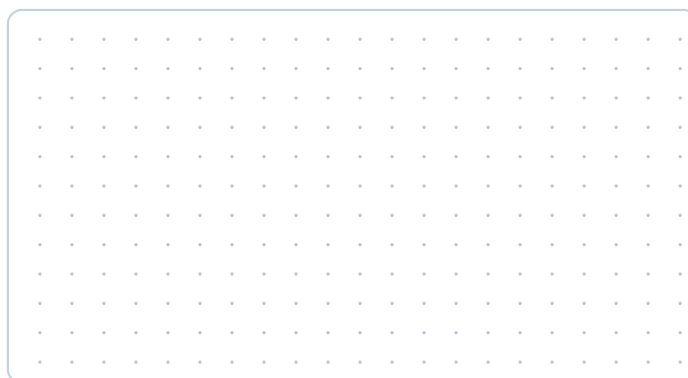
- 21 Which is larger, 6 cm^2 or 610 mm^2 ? Circle your answer. [1 mark]
☐ 610 mm^2 ☐ 6 cm^2

- 22 Ben shares £80 with a friend in the ratio 1 : 4 and keeps the smaller part. Dev shares £100 in the ratio 2 : 3 and keeps the smaller part. Who keeps more? Circle your answer. [1 mark]
☐ Ben ☐ They keep the same ☐ Dev

- 23 This sphere has a radius of 12 centimetres. The area of the circle through its centre is left unpainted. What area is painted, to one decimal place? [3 marks]

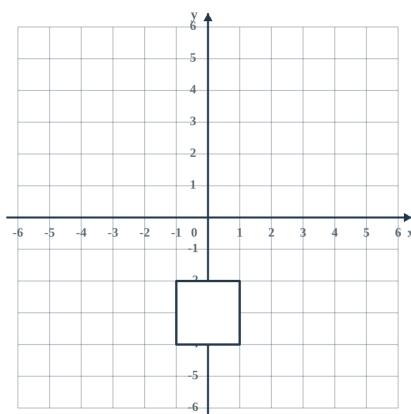


a sphere of this radius

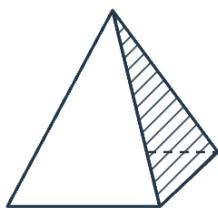


ANSWER

- 24 Mark where each corner of the shape lands after a slide of 2 left and 3 up. Plot the points on the grid. [1 mark]



- 25** A box holds 8 identical solids like this one. Each one has a square base of side 8 centimetres and a perpendicular height of 9 centimetres. What is their total volume in cubic centimetres? [2 marks]



The solid

Grid area for working out the answer to Question 25.

ANSWER

- 26** One cone has a volume of 235.6 cubic centimetres. A second cone has every length twice as big. What is its volume, to one decimal place? [2 marks]

Grid area for working out the answer to Question 26.

ANSWER

Practice Paper 2

FOR THE MARKER

The marks for every question, the answers to accept and what to award for part of an answer. 39 marks in total.

1	512 cm ²	[1 mark]
2	3053.6 cm ³	[1 mark]
3	314.2 cm ²	[1 mark]
4	678.6 cm ²	[1 mark]
5	3	[1 mark]
6	33.0 cm ³ <i>Award 2 marks for the correct answer. Award 1 mark for a correct method, or for the correct value before rounding or rounded incorrectly.</i>	[2 marks]
7	4188.8 cm ³ <i>Award 2 marks for the correct answer. Award 1 mark for a correct method, or for the correct value before rounding or rounded incorrectly.</i>	[2 marks]
8	1526.8 cm ³ <i>Award 2 marks for the correct answer. Award 1 mark for a correct method, or for the correct value before rounding or rounded incorrectly.</i>	[2 marks]
9	5 of the 8 shares <i>Award the mark when the drawing or marking matches the answer shown.</i>	[1 mark]
10	the volume of a cone $\rightarrow \pi \times \text{radius}^2 \times \text{height} \div 3$; the volume of a cylinder $\rightarrow \pi \times \text{radius}^2 \times \text{height}$; the surface of a sphere $\rightarrow 4 \times \pi \times \text{radius}^2$ <i>Award the mark only when every part is correct.</i>	[1 mark]
11	sphere $\rightarrow 4 \times \pi \times \text{radius}^2$; cuboid $\rightarrow$ the six rectangular faces added, in three matching pairs; triangular prism $\rightarrow$ the two triangular ends added to the three rectangles <i>Award the mark only when every part is correct.</i>	[1 mark]
12	False <i>Award the mark for the correct choice only. Two or more choices marked scores no mark.</i>	[1 mark]
13	32 ml <i>Award 2 marks for the correct answer. Award 1 mark for a correct method with no more than one arithmetic error.</i>	[2 marks]

14	400	[1 mark]
Award the mark for the correct choice only. Two or more choices marked scores no mark.		
15	The difference is 1 part, so divide by 1	[1 mark]
Award the mark for the correct choice only. Two or more choices marked scores no mark.		
16	565.5 cm ²	[3 marks]
Award 3 marks for the correct answer. Award 2 marks for the correct value before rounding, or rounded incorrectly. Award 1 mark for a correct first step.		
17	5 cm	[2 marks]
Award 2 marks for the correct answer. Award 1 mark for a correct method, or for the correct value before rounding or rounded incorrectly.		
18	0 cubic metres	[2 marks]
Award 2 marks for the correct answer. Award 1 mark for a correct method with no more than one arithmetic error.		
19	1944 g	[2 marks]
Award 2 marks for the correct answer. Award 1 mark for a correct method, or for the correct value before rounding or rounded incorrectly.		
20	2 up only	[1 mark]
Award the mark for the correct choice only. Two or more choices marked scores no mark.		
21	610 mm ²	[1 mark]
Award the mark for the correct choice only. Two or more choices marked scores no mark.		
22	Dev	[1 mark]
Award the mark for the correct choice only. Two or more choices marked scores no mark.		
23	1357.2 cm ²	[3 marks]
Award 3 marks for the correct answer. Award 2 marks for the correct value before rounding, or rounded incorrectly. Award 1 mark for a correct first step.		
24	(-3, -1), (-1, -1), (-1, 1), (-3, 1)	[1 mark]
Award the mark when the drawing or marking matches the answer shown.		
25	1536 cm ³	[2 marks]
Award 2 marks for the correct answer. Award 1 mark for a correct method with no more than one arithmetic error.		
26	1885.0 cm ³	[2 marks]
Award 2 marks for the correct answer. Award 1 mark for a correct method, or for the correct value before rounding or rounded incorrectly.		

Total

39 marks