

Year 11 Higher Maths Practice Paper 3

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.

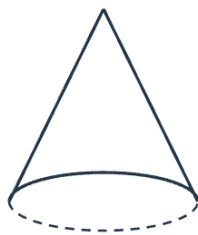
- 1** Change 4 cm^2 into square millimetres.

[1 mark]

ANSWER

- 2** A cone has a base radius of 4 centimetres and a perpendicular height of 14 centimetres. What is its volume, to one decimal place?

[1 mark]

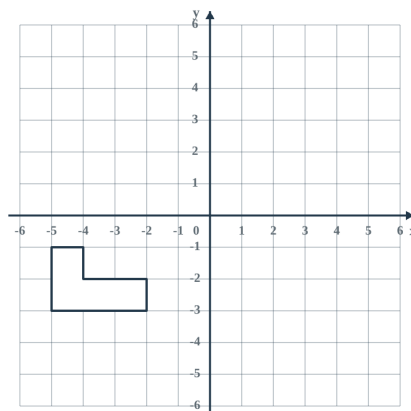


The solid

ANSWER

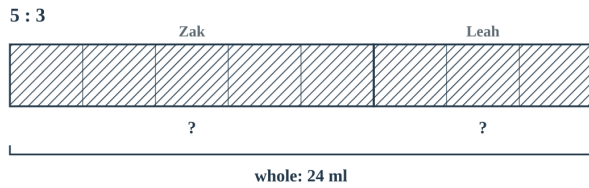
- 3** Slide the shape 1 right and 2 up. Draw the shape in its new position.

[1 mark]



- 4 The whole bar is 24 ml. What is one part worth?

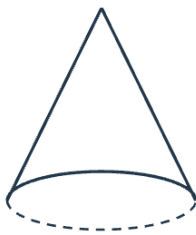
[1 mark]



ANSWER

- 5 This cone has a base radius of 9 centimetres and a perpendicular height of 12 centimetres. What is its volume, to one decimal place?

[1 mark]



The solid

ANSWER

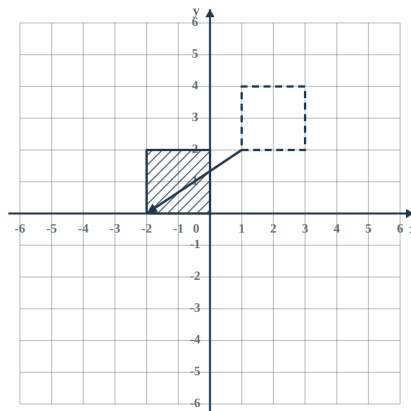
- 6 The shape has moved. Which description fits the slide? Circle your answer.

[1 mark]

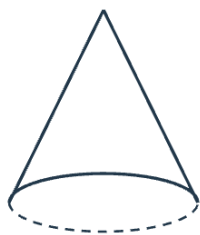
☐ 2 left and 3 down

☐ 4 left and 2 down

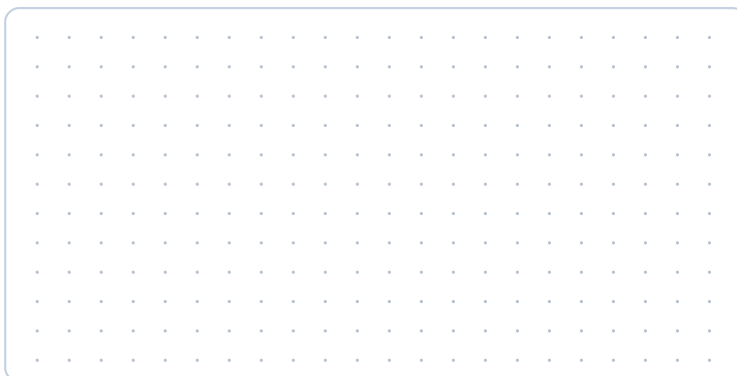
☐ 3 left and 2 down



- 7 The top of this cone is cut off half way up, leaving a smaller cone of radius 4.5 centimetres and height 6 centimetres. What is the volume of that smaller cone, to one decimal place? [1 mark]

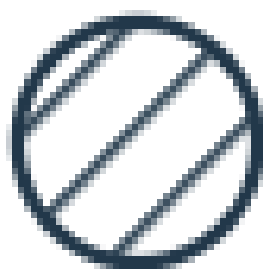


The solid

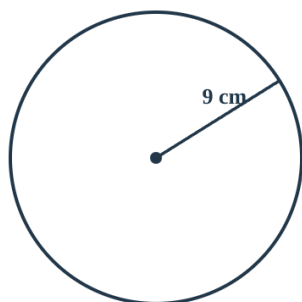


ANSWER

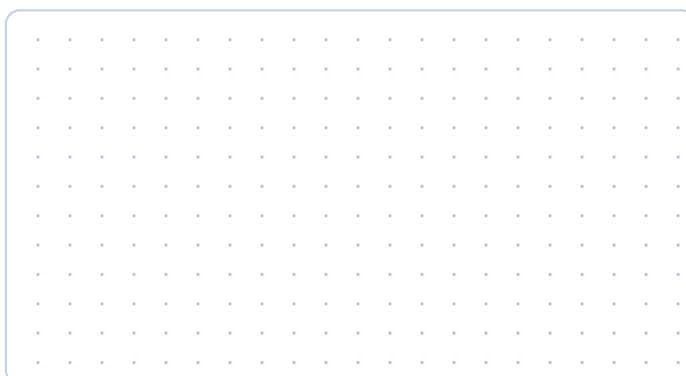
- 8 A rectangle is 2 cm by 2 cm. Build it as an array where each dot stands for one square centimetre. Draw the array. [1 mark]



- 9 The measurements of this sphere are given: it has a radius of 9 centimetres. What is the radius cubed, in square centimetres? [1 mark]

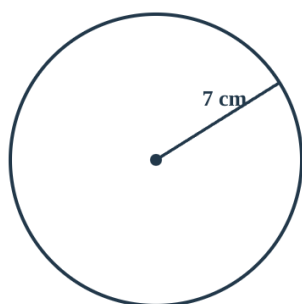


a sphere of this radius



ANSWER

- 10 A sphere has a radius of 7 centimetres. What is its volume, to one decimal place? [1 mark]



a sphere of this radius

ANSWER

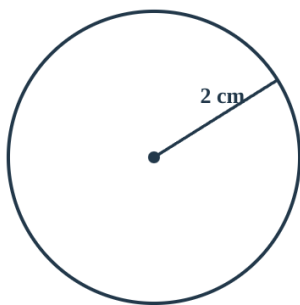
- 11 Work out the volume of a sphere that has a radius of 3 centimetres. Give your answer to one decimal place. [2 marks]

ANSWER

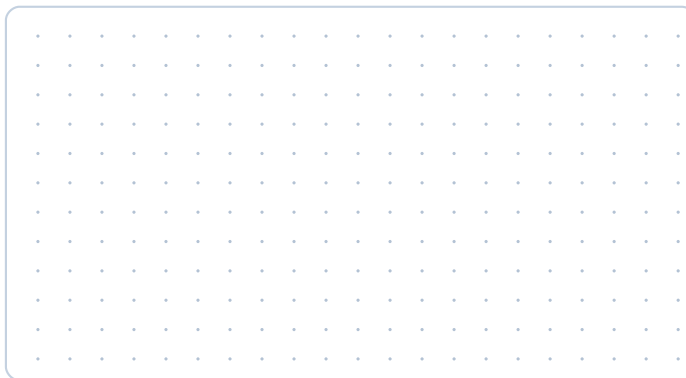
- 12 A sphere has a volume of 33.5 cubic centimetres. What is the volume of a hemisphere of the same radius, to one decimal place? [2 marks]

ANSWER

- 13 Only part of the surface is wanted this time. This sphere has a radius of 2 centimetres. [2 marks]
What is the curved surface area of half the sphere, to one decimal place?



a sphere of this radius



ANSWER

- 14 Match each solid to the rule that gives its volume. Draw a line from each item on the left to its match on the right. [1 mark]

sphere

•

• the area of the base $\times$ the height $\div 3$

cuboid

•

• $4 \div 3 \times \pi \times \text{radius}^3$

square-based pyramid

•

• length $\times$ width $\times$ height

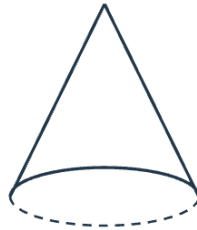
- 15 Why are there 1,000,000 cm^3 in 1 m^3 , and not 100? Circle your answer. [1 mark]
- ☐ Because m^3 is a bigger word than cm^3 ☐ There are only 100; the rest is rounding
- ☐ A m cube is 100 by 100 by 100 small cubes

- 16 Tara says the volume of this sphere is 205.3 cubic centimetres. It has a radius of 7 centimetres. What is the volume really? Circle your answer. [1 mark]
- ☐ 2873.5 ☐ 1436.8 ☐ 205.3



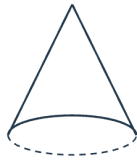
a sphere of this radius

- 17 Kai says the volume of this cone is 1407.4 cubic centimetres. It has a base radius of 8 centimetres and a perpendicular height of 7 centimetres. What is the volume really? [1 mark]
Circle your answer.
- ☐ 938.3 ☐ 1407.4 ☐ 469.1



The solid

- 18 Grace says the surface area of this cone is 427.3 square centimetres. It has a base radius of 8 centimetres and a slant height of 17 centimetres. What is the surface area really? Circle your answer. [1 mark]
- ☐ 628.3 ☐ 427.3 ☐ 314.2



The solid



Its net

- 19 Jack gave the volume of the cut-off cone as 37.7 cubic centimetres. The cone has radius 3 centimetres and height 4 centimetres and is cut half way up. What is the volume of the piece that is left? Circle your answer.
- ☐ 37.7 ☐ 4.7 ☐ 33.0



The solid

- 20** Red, blue and green paint are mixed in the ratio 2 : 4 : 6. There are 72 litres altogether. [3 marks]
How many litres of blue are there?

ANSWER

Page 10 of 10

- 21 A cube has edges of 5 cm. What is its volume in cubic millimetres? [2 marks]

ANSWER

Page 10 of 10

- 22** A sphere has a volume of 268.1 cubic centimetres. What is its radius, to the nearest centimetre? [2 marks]

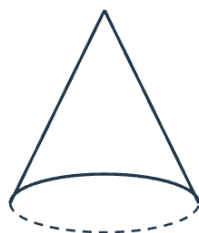
ANSWER

Page 10 of 10

- 23** Nia casts a sphere in metal. It has a radius of 5 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

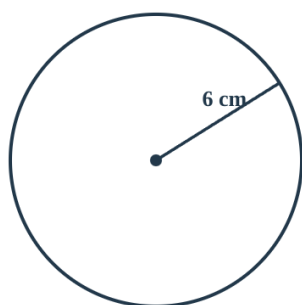
- 24** A closed container is a cut-off cone with radii of 6 centimetres and 3 centimetres and a slant height of 5 centimetres. What is its total surface area, to one decimal place? [3 marks]



The solid

ANSWER

- 25** A box holds 6 identical solids like this one. Each one has a radius of 6 centimetres. What is their total volume, to one decimal place? [3 marks]



a sphere of this radius

ANSWER

26

One sphere has a volume of 904.8 cubic centimetres. A second sphere has every length twice as big. What is its volume, to one decimal place?

[2 marks]

ANSWER

Practice Paper 3

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	400 square millimetres	[1 mark]
2	234.6 cm ³	[1 mark]
3	1 right and 2 up <i>Award the mark when the drawing or marking matches the answer shown.</i>	[1 mark]
4	3 ml	[1 mark]
5	1017.9 cm ³	[1 mark]
6	3 left and 2 down <i>Award the mark for the correct choice only. Two or more choices marked scores no mark.</i>	[1 mark]
7	127.2 cm ³	[1 mark]
8	2 rows of 2 <i>Award the mark when the drawing or marking matches the answer shown.</i>	[1 mark]
9	729 cm ²	[1 mark]
10	1436.8 cm ³	[1 mark]
11	113.1 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]
12	16.8 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]
13	25.1 cm ² <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]
14	sphere $\rightarrow 4 \div 3 \times \pi \times \text{radius}^3$; cuboid $\rightarrow \text{length} \times \text{width} \times \text{height}$; square-based pyramid $\rightarrow \text{the area of the base} \times \text{the height} \div 3$ <i>Award the mark only when every part is correct.</i>	[1 mark]

15	A m cube is 100 by 100 by 100 small cubes	[1 mark]
<i>Award the mark for the correct choice only. Two or more choices marked scores no mark.</i>		
16	1436.8	[1 mark]
<i>Award the mark for the correct choice only. Two or more choices marked scores no mark.</i>		
17	469.1	[1 mark]
<i>Award the mark for the correct choice only. Two or more choices marked scores no mark.</i>		
18	628.3	[1 mark]
<i>Award the mark for the correct choice only. Two or more choices marked scores no mark.</i>		
19	33.0	[1 mark]
<i>Award the mark for the correct choice only. Two or more choices marked scores no mark.</i>		
20	24 litres	[3 marks]
<i>Award 3 marks for the correct answer. Award 2 marks for a complete method with no more than one arithmetic error. Award 1 mark for a correct first step.</i>		
21	125000 cubic millimetres	[2 marks]
<i>Award 2 marks for the correct answer. Award 1 mark for a correct method with no more than one arithmetic error.</i>		
22	4 cm	[2 marks]
<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>		
23	4189 g	[2 marks]
<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>		
24	282.7 cm ²	[3 marks]
<i>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.</i>		
25	5428.7 cm ³	[3 marks]
<i>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.</i>		
26	7238.2 cm ³	[2 marks]
<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>		

Total

39 marks