

Dr Oliver Mathematics
Mathematics: National Qualifications N5
2026 Paper 2: Calculator
1 hour 30 minutes

The total number of marks available is 50.

To earn full marks you must show your working in your answers.

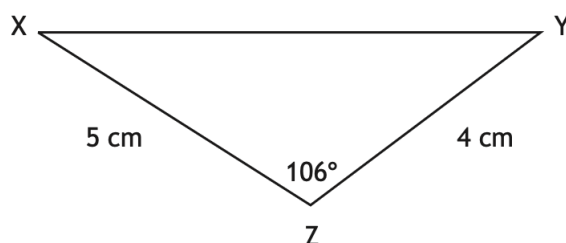
1. A van was valued at £22 600. (4)

Its value depreciated by 28% each year for the next three years.

Calculate the value of the van after three years.

Give your answer correct to 3 significant figures.

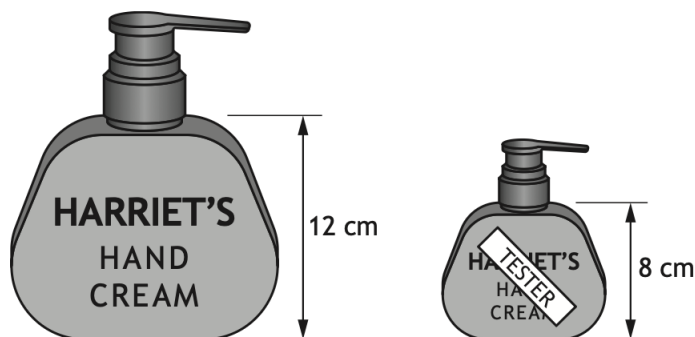
2. In triangle XYZ : (3)



- $XZ = 5$ centimetres.
- $YZ = 4$ centimetres.
- Angle $XZY = 106^\circ$.

Calculate the length of XY .

3. Harriet's Hand Cream is available in two sizes of bottles which are mathematically similar. (3)



- The larger bottle has a height of 12 centimetres and a volume of 540 millilitres.
- The tester bottle has a height of 8 centimetres.

Calculate the volume of the tester bottle.

4. For a hobby, Alex makes cups and plates.

To make 5 cups and 6 plates, it takes Alex 45 minutes.

Let c be the number of minutes Alex takes to make a cup and p be the number of minutes Alex takes to make a plate.

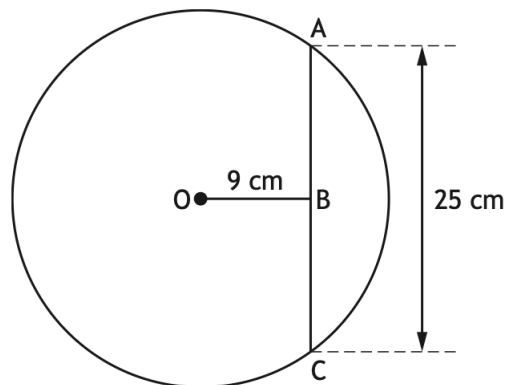
- (a) Write down an equation in c and p . (1)

To make 7 cups and 4 plates, it takes Alex 52 minutes.

- (b) Write down an equation in c and p to illustrate this information. (1)

- (c) Calculate, algebraically, the **total** number of minutes it will take Alex to make 10 cups and 8 plates. (4)

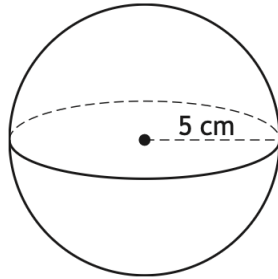
5. The diagram shows a circle, centre O , with chord AC . (3)



- AC is 25 centimetres.
- B is the midpoint of AC .
- OB is 9 centimetres.

Calculate the length of the radius of the circle.

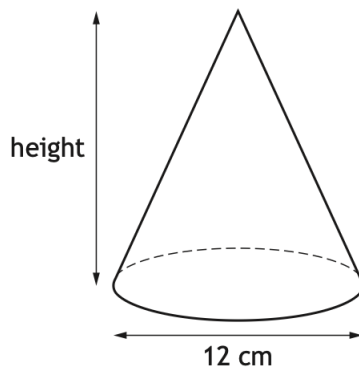
6. A sphere has radius 5 centimetres.



(a) Calculate the volume of the sphere.

(2)

This cone has the same volume as the sphere.



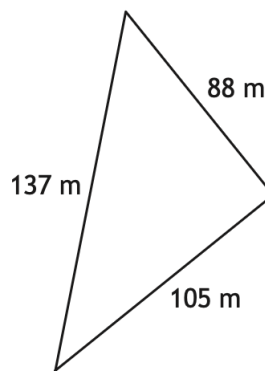
The base of the cone has diameter 12 centimetres.

(b) Calculate the height of the cone.

(3)

7. A triangle has sides of length 88 metres, 105 metres and 137 metres.

(3)



Determine whether the triangle is right-angled.

Justify your answer.

8. Solve the equation

$$5 \tan x^\circ + 3 = 4, \text{ for } 0 \leq x < 360.$$

(3)

9. Express

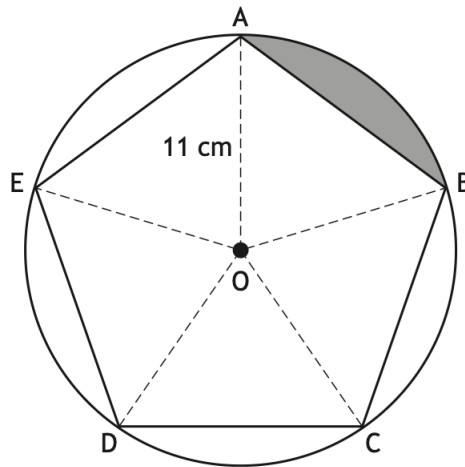
$$\frac{x^2 - 81}{5} \div \frac{x + 9}{2}, x \neq -9,$$

(3)

as a single fraction in its simplest form.

10. The vertices of a regular pentagon, $ABCDE$, lie on a circle, centre O .

(5)



The radius of the circle is 11 centimetres.

Calculate the area of the shaded segment.

11. Simplify

$$\frac{a^{17}}{(3a^4)^3}.$$

(3)

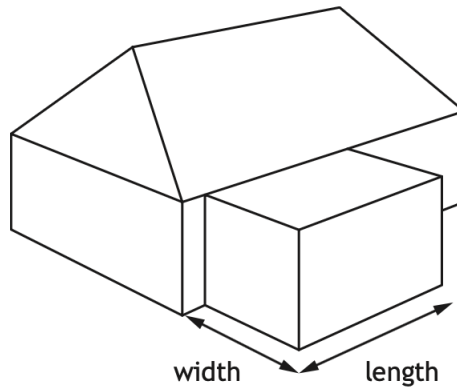
12. Express the following in its simplest form:

(2)

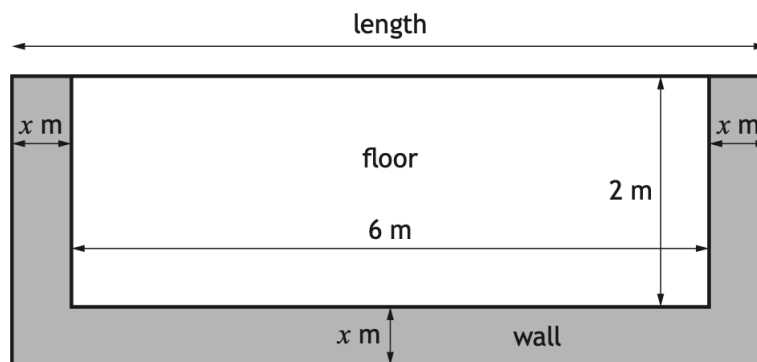
$$\cos x^\circ \sin^2 x^\circ + \cos^3 x^\circ.$$

Show your working.

13. An extension with a rectangular base is being added to the rear of a house.



The diagram below shows a plan of the rectangular base of the extension.



- The length of the floor is 6 metres and the width of the floor is 2 metres.
- There is a wall x metres thick on three sides of the extension.

(a) Write down an expression for the length of the extension in terms of x . (1)

The total area of the rectangular base of the extension is 17 square metres.

(b) Show that (2)

$$2x^2 + 10x - 5 = 0.$$

(c) Calculate x , the thickness of the wall. (4)
Give your answer correct to two decimal places.