Instructions

Answers

This means write down your answer or show your working and your answer.

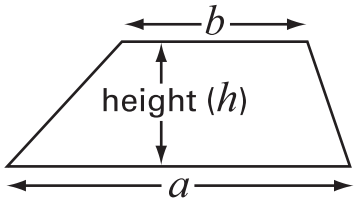
Calculators

You **may** use a calculator in this test.

Formulae

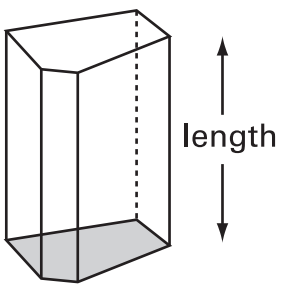
You might need to use these formulae.

Trapezium



Area = $\frac{(a+b)}{2} \times h$

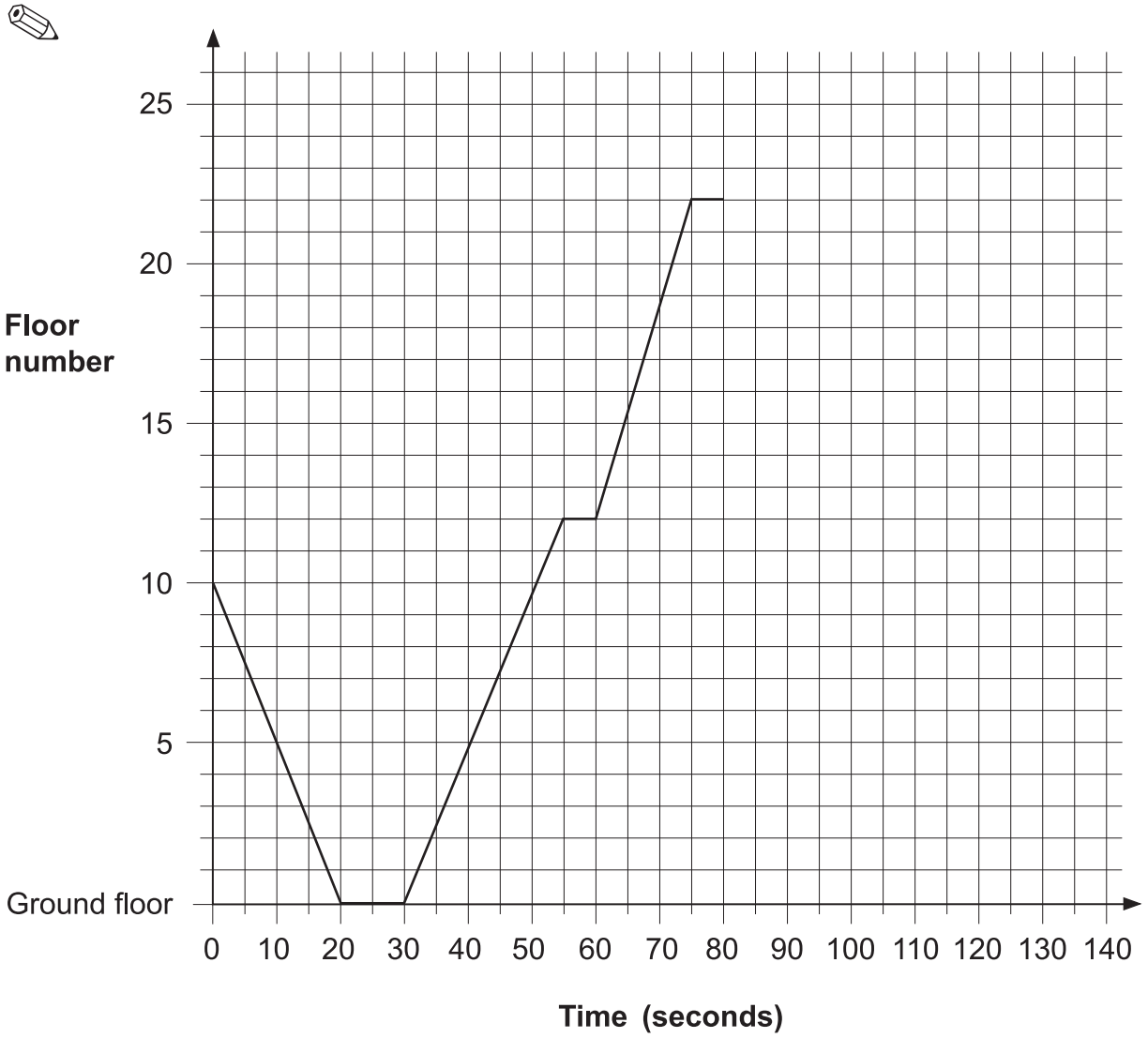
Prism



Volume = area of cross-section × length

1. The graph shows my journey in a lift.

I got in the lift at floor number 10



(a) The lift stopped at two different floors before I got to floor number 22

What floors were they?

floors . . . . . and . . . .

1 mark

(b) For how long was I in the lift while it was moving?

. . . . . seconds

1 mark

(c) After I got out of the lift at floor number 22, the lift went directly to the ground floor.

It took **45 seconds**.

On the graph, show the journey of the lift from floor 22 to the ground floor.

1 mark

2. (a) Paula played four games in a competition.
In **three** games, Paula scored **8** points each time.
In the other game she scored **no** points.

What was Paula's **mean** score over the **four** games?

. . . . . points . . . .
1 mark

(b) Jessie only played **two** games.
Her **mean** score was **3** points.
Her **range** was **4** points.

What points did Jessie score in her two games?

. . . . . and . . . .
1 mark

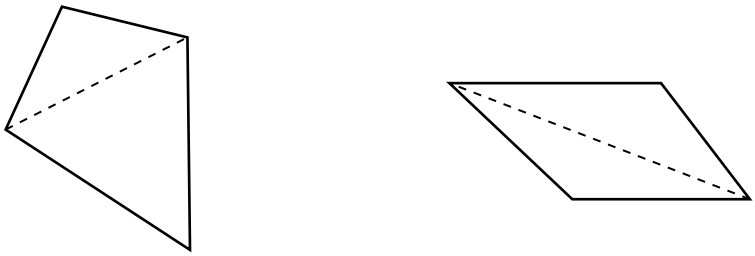
(c) Ali played **three** games.
His **mean** score was also **3** points.
His **range** was also **4** points.

What points might Ali have scored in his three games?
Show your working.

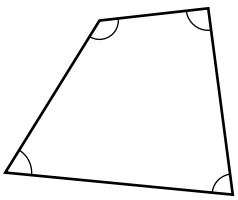
. . . .

. . . . . and . . . . . and . . . .
2 marks

3. (a) Any quadrilateral can be split into 2 triangles.

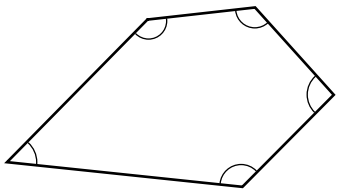


Explain how you know that the angles inside a **quadrilateral** add up to **360°**



. . . . .
1 mark

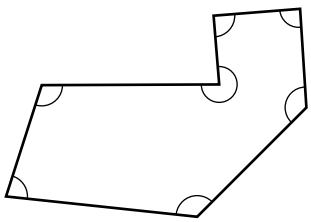
(b) What do the angles inside a **pentagon** add up to?



. . . . . °
. . . . .
1 mark

(c) What do the angles inside a **heptagon** (7-sided shape) add up to?

Show your working.



. . . . . °
. . . . .
. . . . .
2 marks

4. A garden centre sells plants for hedges.
The table shows what they sold in one week.

Plants	Number of plants sold	Takings
Beech	125	£212.50
Leylandii	650	£2437.50
Privet	35	£45.50
Hawthorn	18	£23.40
Laurel	5	£32.25
Total	**833**	**£2751.15**

(a) What percentage of the total number of plants sold was **Leylandii**?
Show your working.

. . . .

. . . . . % . . . .
2 marks

(b) What percentage of the **total takings** was for Leylandii?
Show your working.

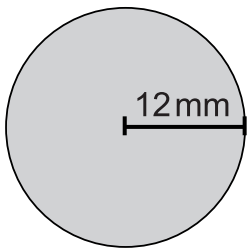
. . . .

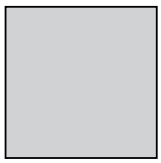
. . . . . % . . . .
2 marks

(c) Which is the **cheaper** plant, Beech or Privet?
Show working to explain how you know.

. . . .
1 mark

5. The diagram shows a circle and a square.





Not drawn accurately

(a) The radius of the circle is 12 mm.

What is the **area** of the circle to the nearest mm^2?

Show your working.

. . . .

. . . . . mm^2 . . . .

2 marks

(b) The **ratio** of the area of the **circle** to the area of the **square** is **2 : 1**

What is the area of the square to the nearest mm^2?

. . . . . mm^2 . . . .

1 mark

(c) What is the side length of the square?

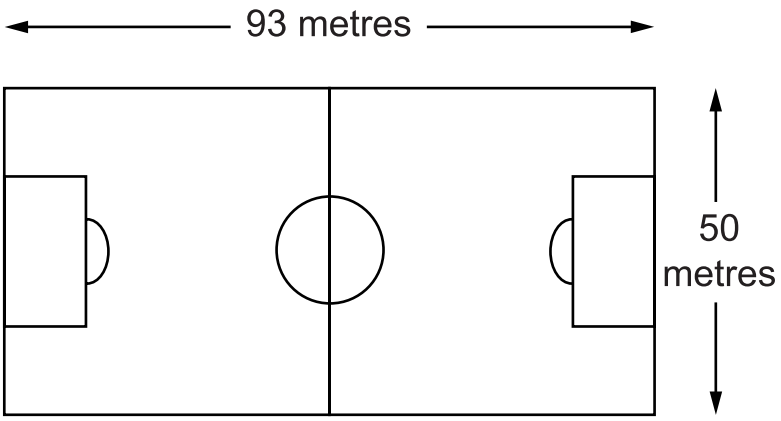
Show your working.

. . . .

. . . . . mm . . . .

2 marks

6. A groundsman marks out a football pitch.



(a) He makes the pitch 93 metres long, to the nearest metre.

What is the **shortest possible** length of the pitch?

. . . . . m . . . .

1 mark

(b) He makes the pitch 50 metres wide, to the nearest metre.

What is the **shortest possible** width of the pitch?

. . . . . m . . . .

1 mark

(c) Des wants to know how many times he should run around the outside of this pitch to be sure of running **at least 3km**.

Use your answer to parts (a) and (b) to find how many times Des should run around the pitch.

You **must** show your working.

. . . .

. . . .

2 marks

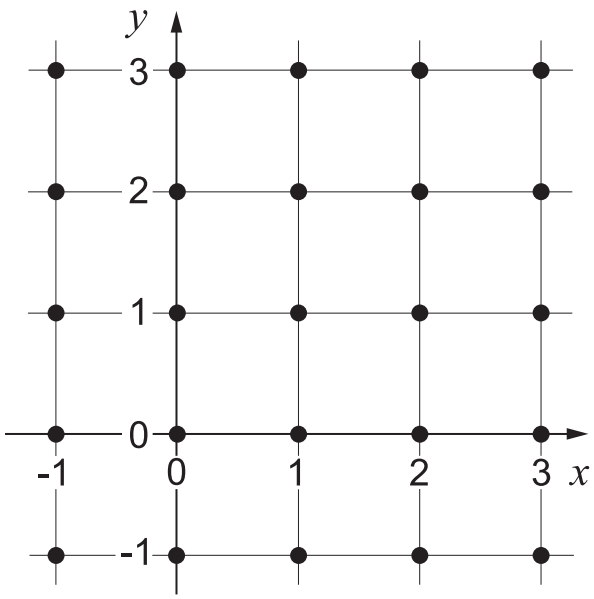
7. I am thinking of a point on the dotted grid below.
The co-ordinates of my point are (x, y)

You have 3 clues to find which of the dots is my point.

(a) **First clue:** $x > 0$ and $y > 0$

Which dots **cannot** represent my point?

On the grid below, **cross them out** like this ✕



. . . .

. . . .
2 marks

(b) **Second clue:** $x + y < 4$

Which other dots **cannot** represent my point?

This time, put a **square around them** like this ⊡

. . . .
1 mark

(c) **Third clue:** $x > y$

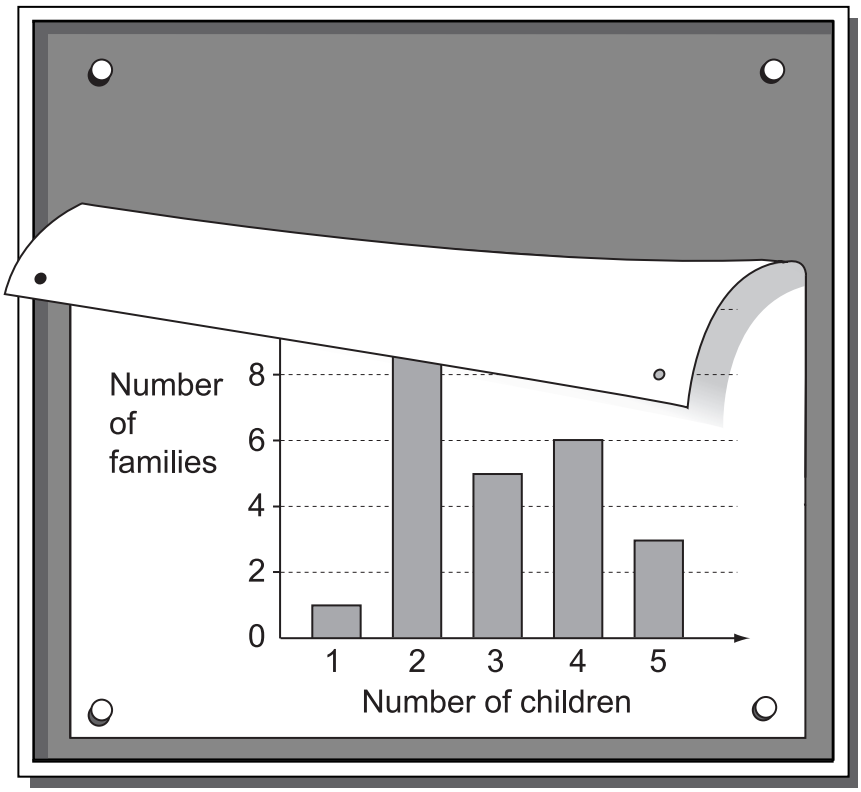
What are the co-ordinates of my point?

(,)

. . . .
1 mark

8. A class collected information about the number of children in each of their families.

The information was displayed in a frequency chart, but you cannot see all the information.



Call the number of families that have **two** children n

(a) Show that the **total** number of children in all the families is $55 + 2n$

. . . .
1 mark

(b) Write an expression for the **total number of families**.

. . . .
1 mark

(c) The **mean** number of children per family is **3**

What is the value of n?

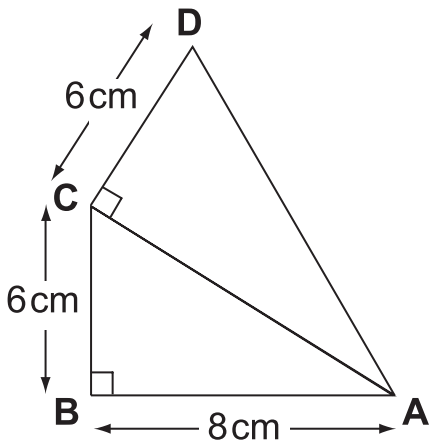
Show your working.

n = ...

. . . .

2 marks

9. ABC and ACD are both right-angled triangles.



Not drawn accurately

(a) Explain why the length of AC is 10 cm.

. . . .

1 mark

(b) Calculate the length of AD

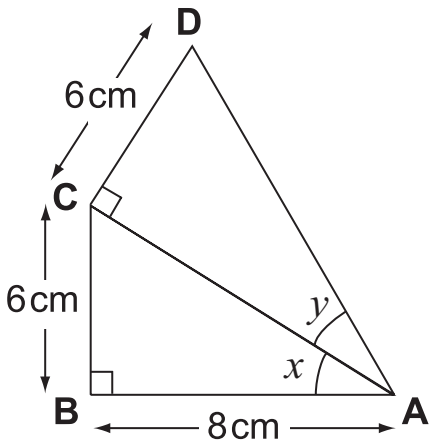
Show your working.

. . . .

. . . . . cm

. . . .

2 marks



Not drawn accurately

(c) By how many degrees is angle x bigger than angle y?

Show your working.

. . . .

. . . .

. . . . . ° . . . .

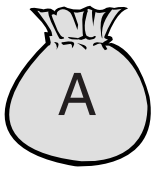
3 marks

10. I have two bags of counters.

Bag A contains

12 red counters and

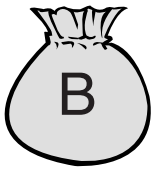
18 yellow counters.



Bag B contains

10 red counters and

16 yellow counters.



I am going to take one counter at random from either bag A or bag B

I want to get a **red** counter.
Which bag should I choose?

Show working to explain your answer.

. . . .

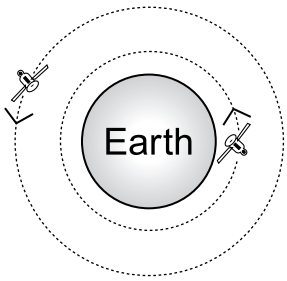
. . . .

2 marks

11. Two satellites circle around the Earth.
The distance from the centre of the Earth is:

1.53×10^7 m Satellite A

9.48×10^6 m Satellite B



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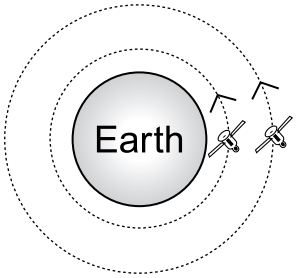


(a) What is the **minimum distance apart** the satellites could be?

Show your working and give your answer in standard form.

. . . .

. . . . . m . . . .

2 marks

(b) What is the **maximum distance apart** the satellites could be?

Show your working and give your answer in standard form.

. . . .

. . . . . m . . . .

2 marks

12. A teacher asked fifty pupils in Year 9:

> How much time did you spend on homework last night?

Results:

Time spent on homework (minutes)	Frequency
$0 \leq$ time $\leq$ 30	6
$30 <$ time $\leq$ 60	14
$60 <$ time $\leq$ 90	21
$90 <$ time $\leq$ 120	9
Total	**50**

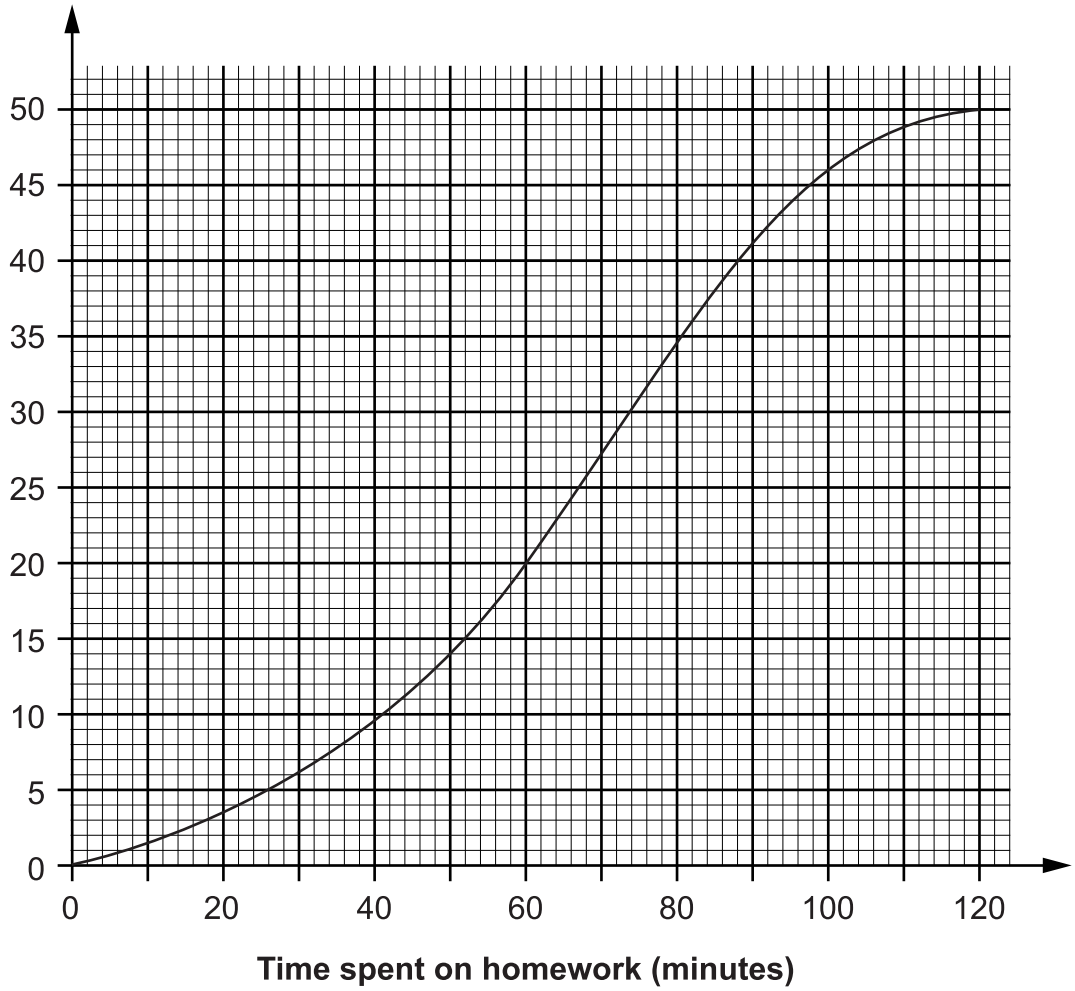
(a) Show that an estimate of the **mean** time spent on homework is **64.8 minutes**.

. . . .

. . . .

2 marks

The teacher used the data to draw a cumulative frequency diagram.



(b) Use the diagram to estimate the **median** time pupils spent on their homework.

Show on the diagram how you get your answer.

. . . . .

. . . . . minutes . . . . .

2 marks

(c) Use the diagram to estimate how many pupils spent **more than 100 minutes** on their homework.

Show how you get your answer.

. . . . .

. . . . . pupils . . . . .

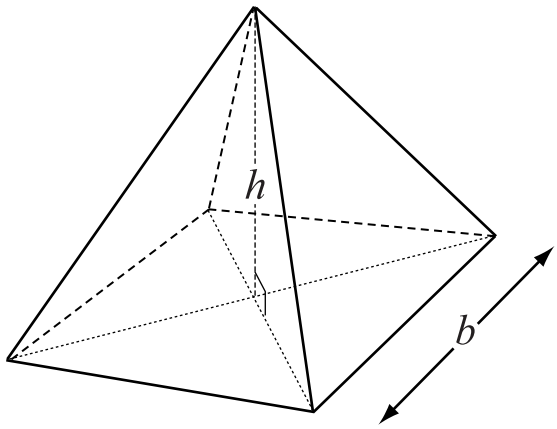
2 marks

13. The formula for the volume, V, of a square-based pyramid is

$$V = \frac{1}{3}b^2h$$

b is the base length,

h is the perpendicular height.



(a) A square-based pyramid has base length 5 cm and perpendicular height 6 cm.

What is its volume?

V = ... cm^3 . . . .

1 mark

(b) A different square-based pyramid has base length 4 cm. Its volume is 48 cm^3

What is its perpendicular height?

h = ... cm . . . .

1 mark

(c) The volume of another square-based pyramid is 25 cm^3
Its perpendicular height is 12 cm.

What is its base length?

Show your working.

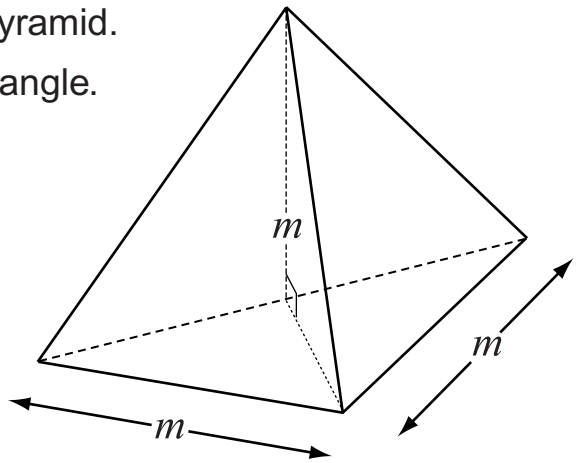
. . . .

b = ... cm

. . . .
2 marks

(d) The diagram shows a triangular-based pyramid.
The base is an isosceles, right-angled triangle.
The perpendicular height is m

Write a formula, in terms of m,
for the volume, V, of the pyramid.



. . . .
1 mark

14. John makes two clay pots.
Each pot is fired independently.
The probability that a pot cracks while being fired is **0.03**

(a) Calculate the probability that **both** of John's pots crack while being fired.

Show your working.

. . . .
1 mark

(b) Calculate the probability that **only one** of John's pots cracks while being fired.

Show your working.

. . . .

. . . .
2 marks

(c) John has enough clay for 80 pots.
He receives an order for 75 pots.

Does he have enough clay to make 75 pots without cracks?

Explain your answer.

. . . .
1 mark

END OF TEST