Name: _____

Maths Genie Stage 7

Test C

Instructions

- Use **black** ink or ball-point pen.
- Answer all questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*
- Diagrams are **NOT** accurately drawn, unless otherwise indicated.
- You must **show all your working out.**
- **Calculators may be used.**

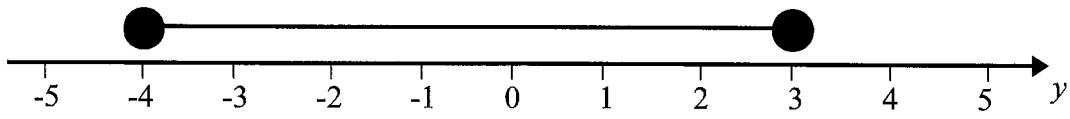
Information

- The marks for each question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

1 Write down the inequality shown on the number line.



1 for -4 and 3

$-4 \leqslant y \leqslant 3$

(Total for Question 1 is 2 marks)

2 The nth term of a sequence is $n^2 + 3$

(a) Find the first two terms of this sequence.

$(1)^2 + 3 = 4$

$(2)^2 + 3 = 7$

4 , 7

(1)

(b) Is 33 a term in this sequence.
You must show how you get your answer.

$n^2 + 3 = 33$

$n^2 = 30 \quad n = \sqrt{30}$

No, $\sqrt{30}$ is not a whole number

(1)

(Total for Question 2 is 2 marks)

3 The table shows the probabilities that a biased dice will land on 1, on 2, on 3, on 5 and on 6.

Number	1	2	3	4	5	6
Probability	0.11	0.1	0.18	0.24	0.15	0.22

The dice is rolled 200 times.

Work out an estimate for the number of times the dice will land on 2 or on 4.

$0.11 + 0.1 + 0.18 + 0.15 + 0.22 = 0.76$

$1 - 0.76 = 0.24$ 1 for 0.24

$0.1 + 0.24 = 0.34$ 1 for "0.34"x200

$0.34 \times 200 = 68$

68

(Total for Question 3 is 3 marks)

4 The table shows information about the number of points scored in a game.

Points	Frequency
0	9
1	11
2	18
3	7
4	4
5	1

0
11
36
21
16
5
50
89

Work out the mean number of points per game.

$\frac{89}{50}$

1 for points x frequency

1 for "89"/"50"

1.78

(Total for Question 4 is 3 marks)

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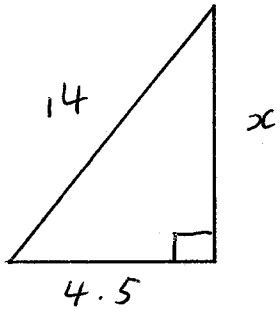
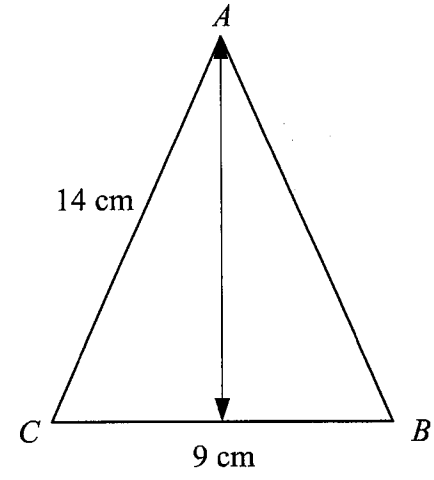
5 *ABC* is an isosceles triangle.

Calculate the perpendicular height of *ABC*.
Give your answer correct to 3 significant figures..





$4.5^2 + x^2 = 14^2$

1 for correct substitution into formula

$x^2 = 14^2 - 4.5^2$

$x = \sqrt{14^2 - 4.5^2}$

1 for correct rearrangement

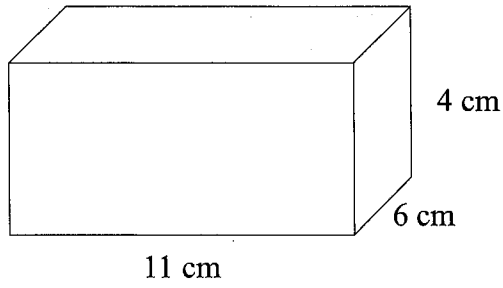
$= 13.3$ cm

13.3 .....cm

(Total for Question 5 is 3 marks)

6 The diagram shows a cuboid.

Find the total surface area of the cuboid.



Front : $11 \times 4 = 44\ cm^2$

Back : $= 44\ cm^2$

Top : $11 \times 6 = 66\ cm^2$

Bottom : $= 66\ cm^2$

Side : $4 \times 6 = 24\ cm^2$

Side : $= 24\ cm^2$

$268\ cm^2$

1 for addition of 6 surfaces

1 for cm^2

268 cm^2

(Total for Question 6 is 3 marks)

7 Adam has some marbles. x
Bradley has three times as many marbles are Adam. $3x$
Chris has 6 more marbles than Bradley. $3x + 6$

In total they have 48 marbles.

How many marbles does Chris have?

$x + 3x + 3x + 6 = 48$

$7x + 6 = 48$ 1 for $7x + 6 = 48$

$7x = 42$

$x = 6$ 1 for 6

Chris $3(6) + 6 = 24$

24

(Total for Question 7 is 3 marks)

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8 Greg bought a new car for £15 000.
In the first year the value of the car depreciates by 25%.
In the second year and the third year the car depreciates by 12%

Work out the value of the car after three years.

$15000 \times 0.75 \times 0.88^2 = £8712$

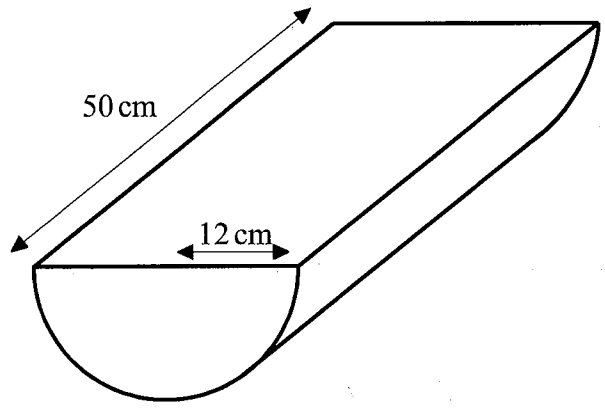
1 for 11250 or 15000 x 0.75

1 for taking 12% from ANS twice or ANS x 0.88^2

£ 8712

(Total for Question 8 is 3 marks)

9 A solid cylinder is cut in half to form a semi-cylinder with a radius of 12 cm and a length of 50 cm.



Work out the volume of the semi-cylinder.
Give your answer correct to 3 significant figures.

$\text{volume} = \frac{\pi r^2}{2} \times h$ 1 for area of circle or semicircle 452.39 or 226.19

$= \frac{\pi (12)^2}{2} \times 50$ 1 for "226.19" x 50 or ("452.39" x 50)/2

$= 11300 \text{ cm}^3$ 11300 ..... cm^3

(Total for Question 9 is 3 marks)