Name: _____

Maths Genie Stage 7

Test A

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   Annie invests £8000 for 5 years in a savings account.
    She gets 1.6% per annum compound interest.

    How much money does Annie have at the end of 5 years.

    1 for finding 1.6% of 8000 or 8000×1.016^5

    $$8000 \times 1.016^5 = £8660.81$$

    £ 8660.81

    (Total for Question 1 is 2 marks)

2   Here are the first 5 terms of a sequence.

            23   17   11   5   -1

    (a) Find the next term of this sequence.

            $-1 - 6$

            -7

            (1)

    The nth term of a different sequence is $5n^2 + 4$

    (b) Work out the 5th term of this sequence.

            $5(5)^2 + 4$

            129

            (1)

    (Total for Question 2 is 2 marks)

3 (a) $-2 < n \leq 3$ where n is an integer.

Write down all the possible values of n.

1 for only one error

$-1, 0, 1, 2, 3$

(2)

(b) Solve $2x + 3 > 18$

$-3 \quad -3$

$2x > 15$

$x > \dfrac{15}{2}$
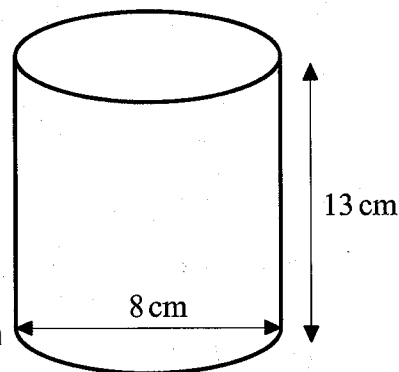
$x > \dfrac{15}{2}$

1 for 7.5 or 15/2

(2)

(Total for Question 3 is 4 marks)

4 A cylinder has a diameter of 8 cm and a height of 13 cm.

Work out the volume of the cylinder.
Give your answer correct to 1 decimal place.

13 cm

8 cm

$volume = \pi r^2 \times h$

1 for correct formula
1 for correct substitution

$= \pi (4)^2 \times 13$

$= 653.5 \text{ cm}^3$

$RADIUS = 4 cm$

653.5 cm³

(Total for Question 4 is 3 marks)

5 A biased spinner can land on red, blue, yellow and green.

The table shows the probabilities that the spinner will land on red, blue and yellow.

Colour	Red	Blue	Yellow	Green
Probability	0.28	0.33	0.25	0.14

Complete the table to show the probability that spinner will land on green.
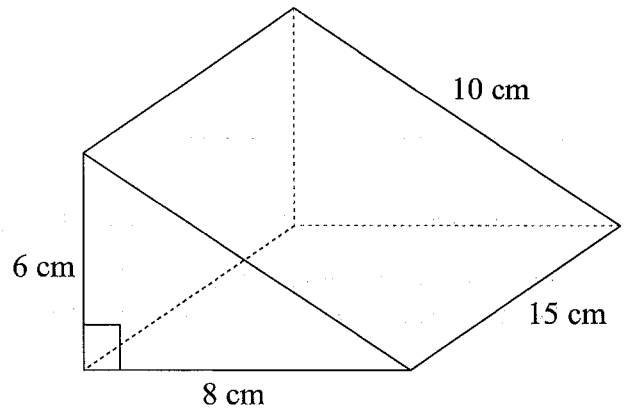
$$0.28 + 0.33 + 0.25 = 0.86$$

$$1 - 0.86 = \underline{\underline{0.14}}$$

1 for 0.86

(Total for Question 5 is 2 marks)

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6 The diagram shows a triangular prism.

Find the total surface area of the triangular prism.

10 cm

6 cm

15 cm

8 cm

Front : $\frac{1}{2} \times 8 \times 6 = 24 \ cm^2$ 1 for 24

Back : $24 \ cm^2$

Bottom : $8 \times 15 = 120 \ cm^2$

Side : $6 \times 15 = 90 \ cm^2$

Top : $10 \times 15 = 150 \ cm^2$

$408 \ cm^2$
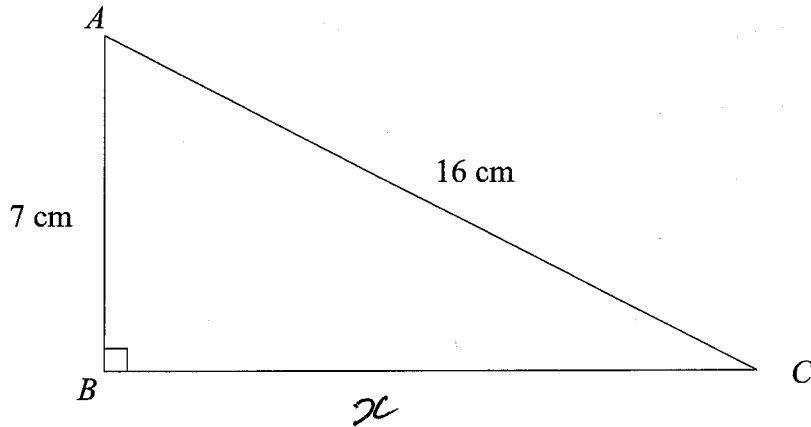
1 for addition of 5 surfaces

$408 \ cm^2$

(Total for Question 6 is 3 marks)

7

A

16 cm

7 cm

B

x

C

Calculate the length of *BC*.
Give your answer to 1 decimal place.

$$x^2 + 7^2 = 16^2$$

1 for correct substitution

$$x^2 = 16^2 - 7^2$$

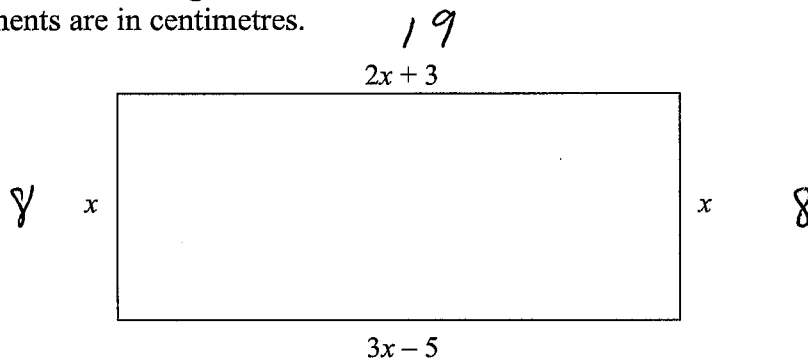$$x^2 = 207$$ 1 for 207

$$x = \sqrt{207} = 14.4$$ ....14.4...........cm

(Total for Question 7 is 3 marks)

8 The diagram shows a rectangle.
All measurements are in centimetres.

19

$2x + 3$

$\cancel{y}$ x

x $\cancel{8}$

$3x - 5$

19

Find the perimeter of the rectangle.

$$2x + 3 = 3x - 5$$

$$-2x \qquad\qquad -2x$$

$$2(8) + 3 = 19$$

1 for perimeter calculation 2(Ans) + 2(8)

$$3 = x - 5$$

$$+5 \qquad\qquad +5$$

$$perimeter = 2(19) + 2(8)$$

$$8 = x$$

$$= 54$$

1 for 8

54 ....cm

(Total for Question 8 is 3 marks)

9 Michael recorded the maximum temperature every day in September.

The table shows information about his results.

Temperature (°C)	Midpoint	Frequency	
$14 < t \leqslant 18$	16	x	8
$18 < t \leqslant 20$	19	x	9
$20 < t \leqslant 22$	21	x	7
$22 < t \leqslant 24$	23	x	4
$24 < t \leqslant 28$	26	x	2

128
171
147
92
52

30

590

Calculate an estimate for the mean maximum temperature.

1 for midpoint x freq

1 for "590"/30

$$\frac{590}{30} = 19.6 \, °C$$

(1dp)

19.7 ....°C

(Total for Question 9 is 3 marks)