Name: _____

Maths Genie Stage 9

Test D

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 not 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

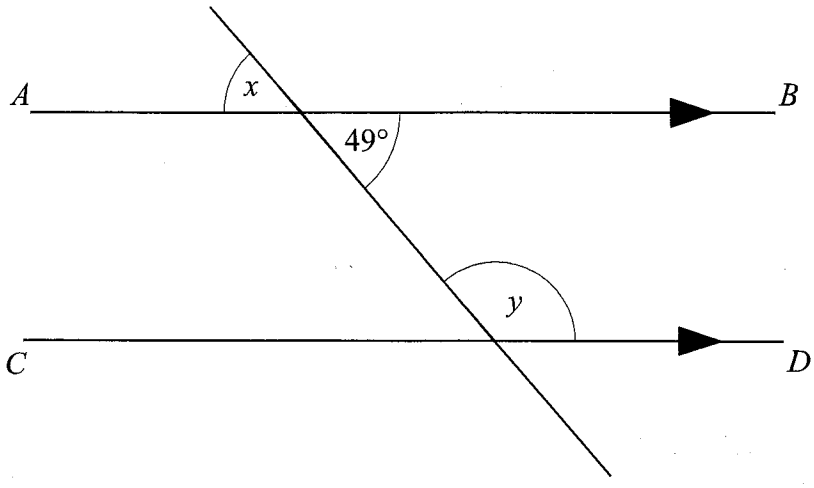
- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end

1 A line passes through the point (0, 7).
The gradient of this line is 5.
Write down the equation of this line.

$y = 5x + 7$

(Total for Question 1 is 2 marks)

2



AB and *CD* are parallel lines.

(a) Write down the size of angle *x*.

49 °

(b) Give a reason for your answer.

opposite angles are equal

(1)

(c) Write down the size of angle *y*.

$180 - 49$

131 °

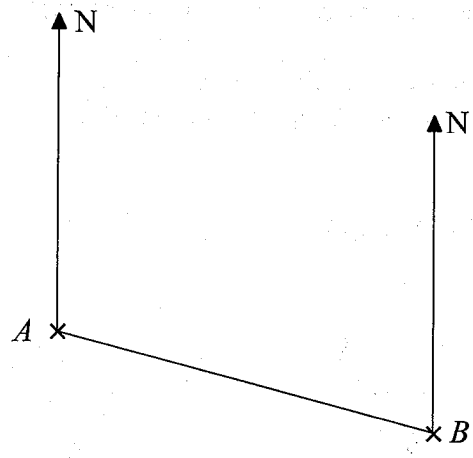
(d) Give a reason for your answer.

Co-interior angles add to 180°

(1)

(Total for Question 2 is 2 marks)

3



(a) Measure the bearing of B from A.

105 °

(1)

(b) Measure the bearing of A from B.

360 − 75

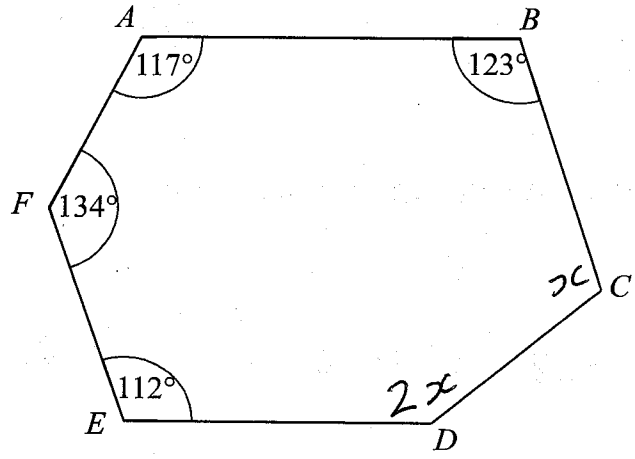
285 °

(1)

(Total for Question 3 is 2 marks)

4

117
123
+ 134
486



ABCDEF is a hexagon.

Angle $CDE = 2 \times$ Angle BCD

4 × 180 = 720°

Work out the size of angle CDE.

6 11 2 0
− 4 8 6
2 3 4

078
3 | 2 2 3 2 4

$x = 78$

$2x = 2 \times 78$

$= 156$

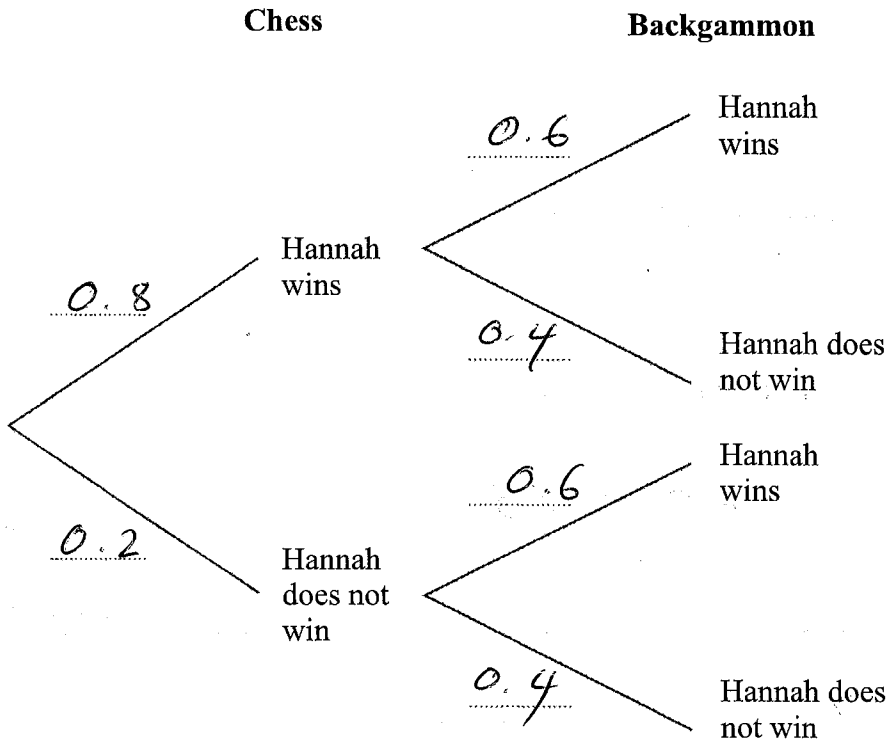
156 °

(Total for Question 8 is 4 marks)

5 Hannah is going to play one game of chess and one game of backgammon.

The probability she will win the game of chess is 0.8
The probability she will win the game of backgammon is 0.6

(a) Complete the probability tree diagram.



(2)

(b) Work out the probability that Hannah will win both games.

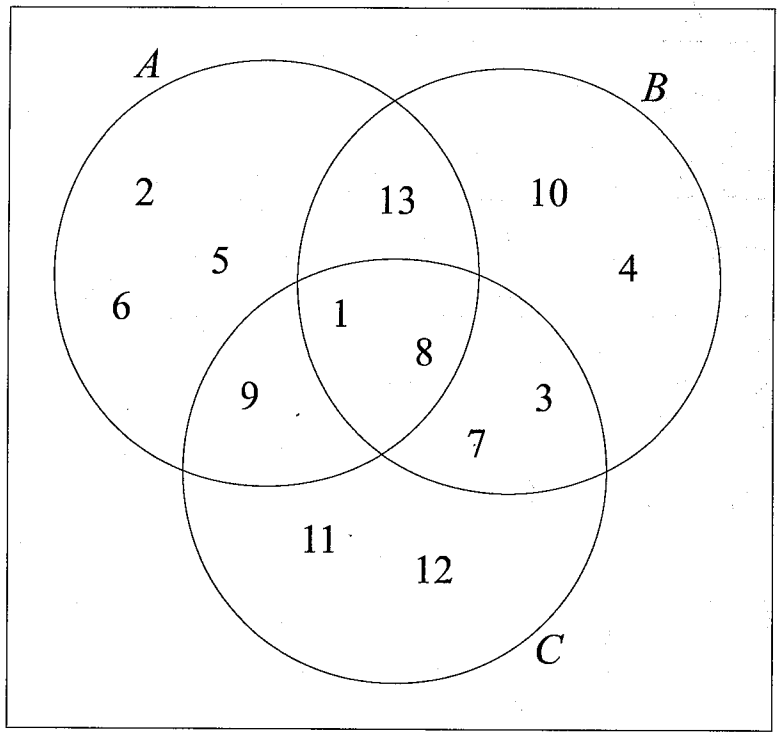
$0.8 \times 0.6 = 0.48$

0.48

(2)

(Total for Question 5 is 4 marks)

6 Here is a Venn diagram.



(a) List the members of A ∩ B

1, 8 and 13

(1)

A number is chosen at random from 8.

(b) Find $P(B \cup C)$

$\frac{10}{13}$

(2)

(Total for Question 6 is 3 marks)

7 Find the gradient of the line that passes through (6, -4) and (1, 9).

$x_1\ y_1\ \ x_2\ y_2$

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$= \frac{9 - -4}{1 - 6} = \frac{13}{-5} = -\frac{13}{5}$$

$-\frac{13}{5}$

(Total for Question 7 is 2 marks)

8 Make a the subject of $v = u + at$

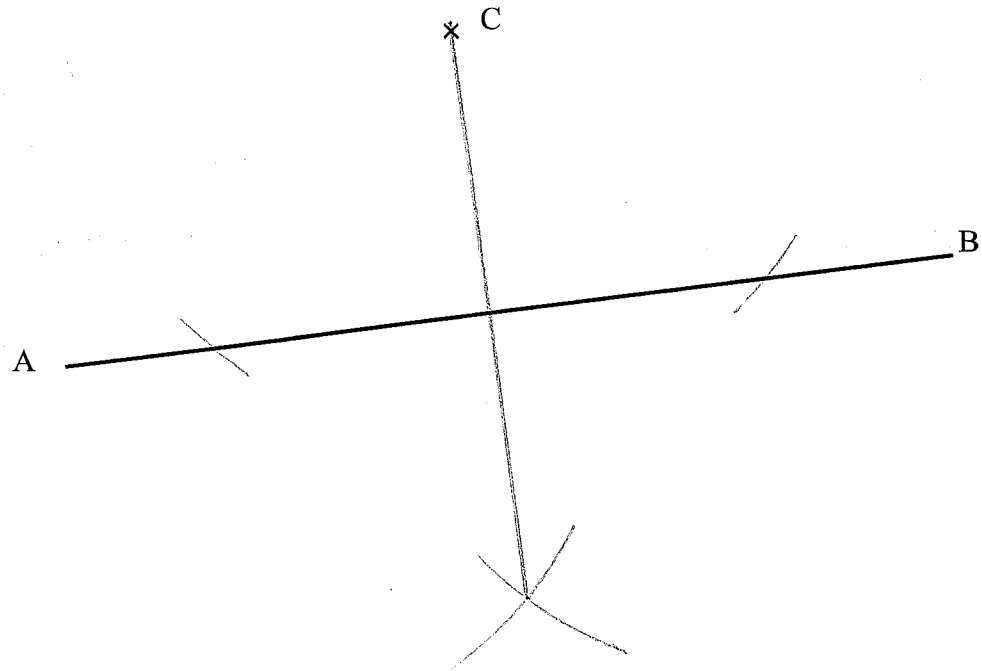
$$v - u = at$$

$$\frac{v - u}{t} = a$$

$$a = \frac{v - u}{t}$$

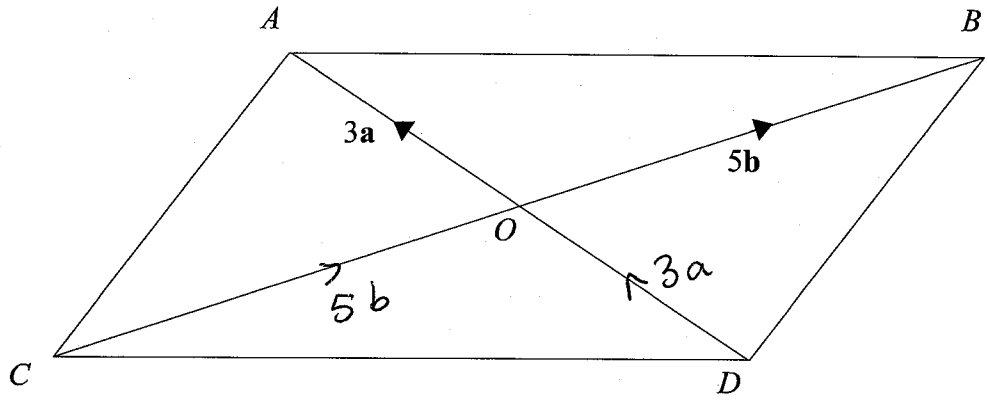
(Total for Question 8 is 2 marks)

9 Use ruler and compasses to construct the perpendicular from point C to the line AB.
You must show all your construction lines.



(Total for Question 9 is 2 marks)

10 The diagram shows a parallelogram.



$\overrightarrow{OA} = 3a$

$\overrightarrow{OB} = 5b$

(a) Find, in terms of a, the vector $\overrightarrow{DA}$

6a

(1)

(b) Find, in terms of a and b, the vector $\overrightarrow{AB}$

-3a + 5b

(1)

(c) Find, in terms of a and b, the vector $\overrightarrow{AC}$

-3a - 5b

(1)

(Total for Question 10 is 3 marks)