



# BENENDEN

Lower School Scholarship 2023

## MATHEMATICS

1 hour

<b>Name:</b>	.....
<b>School:</b>	.....
<b>Date:</b>	.....

***Equipment required: pen, pencil, ruler, eraser.***

***Instructions to Candidates:***

- Attempt all questions. Do not worry if you don't manage to do them all.
- Calculators may **not** be used.
- Show ALL working.
- Check your answers for accuracy.
- Total marks for test : 100

1. A recipe for 8 servings of noodle pudding uses the following ingredients:

125g butter

250g noodles

4 eggs

125g cottage cheese

80g raisins

140g sugar

a) How much of each ingredient would be needed for a party of 32 people?

\_\_\_\_\_ butter

\_\_\_\_\_ noodles

\_\_\_\_\_ eggs

\_\_\_\_\_ cottage cheese

\_\_\_\_\_ raisins

\_\_\_\_\_ sugar

(3)

b) How much of each ingredient would be needed for a different party, of 4 people?

\_\_\_\_\_ butter

\_\_\_\_\_ noodles

\_\_\_\_\_ eggs

\_\_\_\_\_ cottage cheese

\_\_\_\_\_ raisins

\_\_\_\_\_ sugar

(3)

**(Total for question is 6 marks)**

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2. Write an algebraic expression for each of the following:

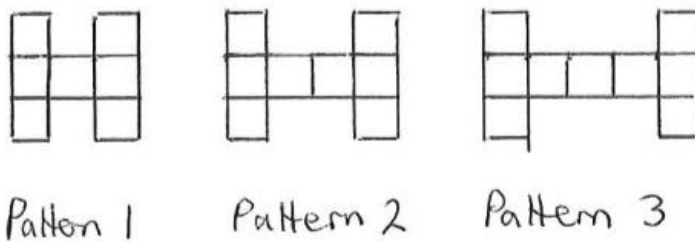
a) The number of pence in  $m$  pounds \_\_\_\_\_ (1)

b) The cost of  $n$  oranges and three times that number of lemons, when an orange costs 56p and a lemon costs half as much.  
\_\_\_\_\_ (3)

**(Total for question is 4 marks)**

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3.



a) Draw the 5<sup>th</sup> pattern

(2)

b) How many matchsticks would be needed to make the 5<sup>th</sup> pattern?

\_\_\_\_\_ (1)

c) Write down the number of squares in the  $n$ th pattern.

\_\_\_\_\_ (2)

d) Write down the number of matchsticks in the  $n$ th pattern.

\_\_\_\_\_ (2)

**(Total for question is 7 marks)**

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4. a) Simplify:  $3a(2a + 3b) - 5(a^2 - b)$

\_\_\_\_\_ (3)

b)  $c = 3, d = -7, e = -4, f = 0$

Find the value of

i)  $cd^2 - e$

\_\_\_\_\_ (3)

ii)  $def + 4ce^2$

\_\_\_\_\_ (3)

**(Total for question is 9 marks)**

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5. The area of a rectangle is  $21\frac{1}{4}$  cm<sup>2</sup>. The length is  $7\frac{1}{2}$  cm.  
What is its width?

\_\_\_\_\_ (Total for question is 4 marks)

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6. a) A car costs £7000 and decreases in value by 20% in the first year and 10% in each subsequent year.

What will the value of the car be after three years?

\_\_\_\_\_ (3)

- b) Sipho travels 555km. It takes him 7.5 hours.

What is his average speed?

\_\_\_\_\_ (3)

**(Total for question is 6 marks)**

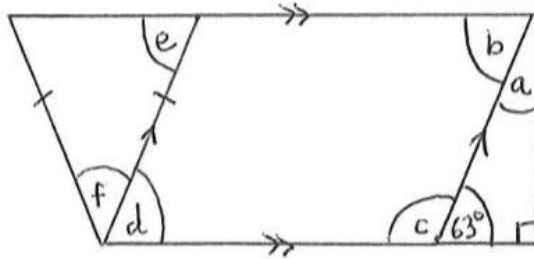
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7. Find the number which fulfils the following:

**The sum of the number and 5 less than double the number is 34.**

\_\_\_\_\_ (Total for question is 4 marks)

8. Find the size of the angles in the diagram and state the angle fact you use in your calculation. The diagram is not drawn to scale.



- a = \_\_\_\_\_ (2)
- b = \_\_\_\_\_ (2)
- c = \_\_\_\_\_ (2)
- d = \_\_\_\_\_ (2)
- e = \_\_\_\_\_ (2)
- f = \_\_\_\_\_ (2)

**(Total for question is 12 marks)**

9. Simplify:

a)  $5xy \times 7xyz \times 2z$

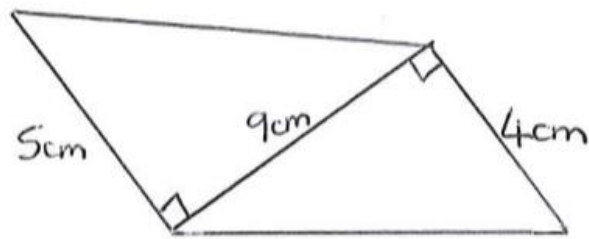
\_\_\_\_\_ (3)

b)  $20a^2 b^4 \div 10a^3 b^5$

\_\_\_\_\_ (3)

**(Total for question is 6 marks)**

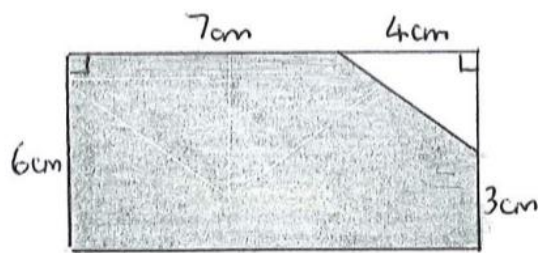
10. a) What is the area of the shape (not drawn to scale) ?



\_\_\_\_\_ (3)

b) i) Find the total length of **all the lines** in the following diagram.

The diagram is not drawn to scale.



\_\_\_\_\_ (3)

ii) Find the area of the shaded part

\_\_\_\_\_ (3)

(Total for question is 9 marks)

11. In Beth's freezer there are  
 4 choc-ices,  
 8 lemon whirls  
 5 strawberry cream ices  
 7 toffee sundaes

Beth puts her hand into the freezer and takes the first iced dessert that she touches.

- a) What is the probability that it is a fruity ice cream? \_\_\_\_\_ (2)  
 b) What is the probability that it is a coffee ice? \_\_\_\_\_ (2)

Beth replaces ~~the ice she takes and she then~~ takes and eats a toffee sundae.  
 Her brother Ben chooses and eats a lemon whirl.

Her sister Jess then takes one at random.

- c) What is the probability that it is a choc-ice? \_\_\_\_\_ (2)  
 d) What is the probability that it is not a strawberry cream? \_\_\_\_\_ (2)

**(Total for question is 8 marks)**

12. Find the value of j

a)  $7(j + 3) + 3j + 1 = 2(j - 13)$

\_\_\_\_\_ (4)

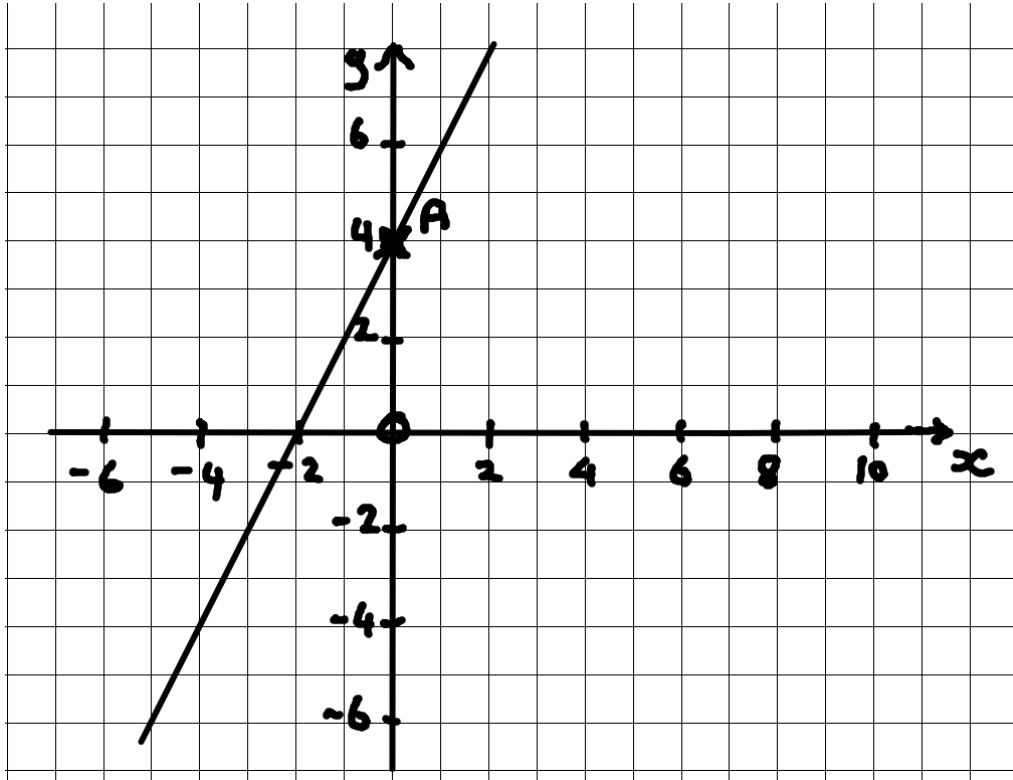
find the value of k

b)  $\frac{3k}{2} - 4 = k + 1$

\_\_\_\_\_ (3)

**(Total for question is 7 marks)**

13.



a) Write down the equation of the straight line shown on the graph:

\_\_\_\_\_ (2)

b) Draw a line which is perpendicular to the given line, passing through point A (2)

c) Write down the equation of this new line

\_\_\_\_\_ (2)

**(Total for question is 6 marks)**

14. The frequency table below shows the number of sweets in each of a selection of bags of sweets.

Number of sweets	Number of bags
10	2
11	4
12	8
13	1

a) What is the modal (mode) number of sweets in a bag? \_\_\_\_\_ (1)

b) What is the median number in a bag? \_\_\_\_\_ (2)

c) Calculate the mean number of sweets per bag  
\_\_\_\_\_ (3)

d) What is the range of the number of sweets? \_\_\_\_\_ (1)

(Total for question is 7 marks)

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15. Find the values of  $m$  and  $n$  if

$$3m - 4n = -26$$

$$2m + 3n = 11$$

$$m = \underline{\hspace{2cm}}$$

$$n = \underline{\hspace{2cm}}$$

**(Total for question is 5 marks)**

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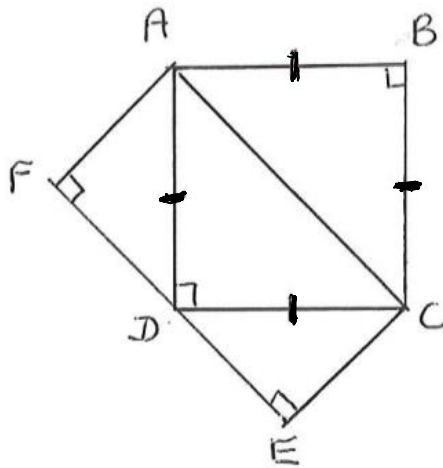
END OF QUESTIONS

Check your work and, if you have time, try the following

- In a Maths class there are 3 boys for every 2 girls.  
The average age of the boys is 14 years 2 months.  
The average age of the girls is 13 years 4 months

What is the average age of the class?

- What is the ratio of the areas  $ABCD : ACDF$  ?



- A cold water tap fills a bath in  $t$  minutes  
A hot water tap fills the bath in half the time.  
If they both run together they fill the bath in 5 minutes.

Find  $t$

