



BENENDEN

Lower School Scholarship Exam 2022

MATHEMATICS

13+

1 Hour

Name:
School:
Date:

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 points for test : 100

1. $a = 9$, $b = -14$ and $c = 20$

Find the value of

a) $a - b$

..... (2)

b) $(2a + b) \times c$

..... (3)

c) $6c - (ab + 6)$

..... (3)

2. Write each of the following in standard form and then place them in order of size, smallest to largest:

0.0705 7.08 79.3 0.007008 560900

..... (6)

3. Work out:

a) $\frac{9}{11} - \frac{2}{5} \times \frac{3}{4}$

..... (3)

b) $3\frac{1}{4} \div 2\frac{3}{5}$

..... (4)

4. Simplify:

a) $8 - 3(2 + 5x)$

..... (3)

b) $t \times tu^4 v^3 \div uv$

..... (4)

5. Mrs Smith has been allocated 250 seats to take the 6th Form at her school to a show. Because she has bought so many tickets she has been given a 15% discount. The normal price of each ticket is £15.

a) How much did she pay in total for the tickets?

..... (3)

8% of the tickets are given to the staff members accompanying the 6th Form.

b) How many staff members get tickets?

..... (2)

$\frac{7}{10}$ of the students who go are girls.

c) How many girls go to the show?

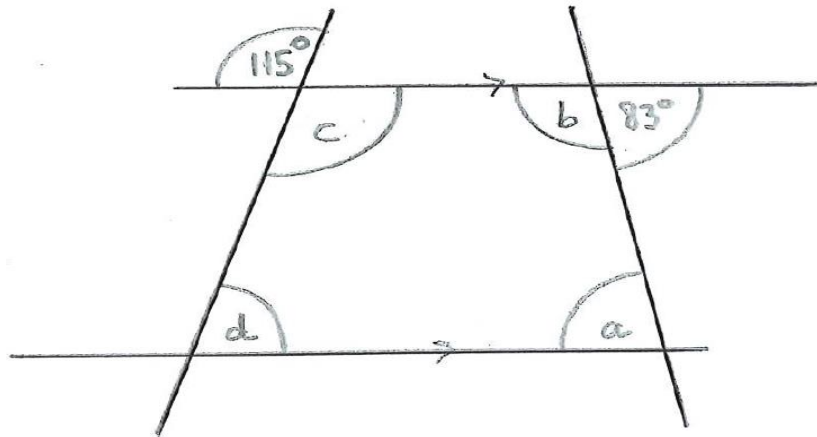
..... (3)

6. Rob hammers seven nails into a piece of wood. The nails are 1.5 cm apart and are in a straight line.

How many centimetres apart are the first and last nails?

..... (2)

7. Calculate the size of each named angle in the diagram below, which is NOT DRAWN TO SCALE:



$a = \dots\dots\dots, b = \dots\dots\dots, c = \dots\dots\dots, d = \dots\dots\dots$ (8)

8. Write down the first four terms of the sequence whose n th term is

a) $5n - 2$

..... (3)

b) $\frac{2}{n}$

..... (3)

9. Kelly has a bag of sweets containing:
15 raspberry creams, 18 chocolates, 22 mints and 25 pear drops.

She takes a sweet at random.

What is the probability that she takes:

a) a mint? (2)

b) a fruity sweet? (1)

c) a toffee? (1)

Last year, Kelly had 120 days of school. If the probability that Kelly is late to school is 0.6, how many days would you expect her to have been late last year?

..... (2)

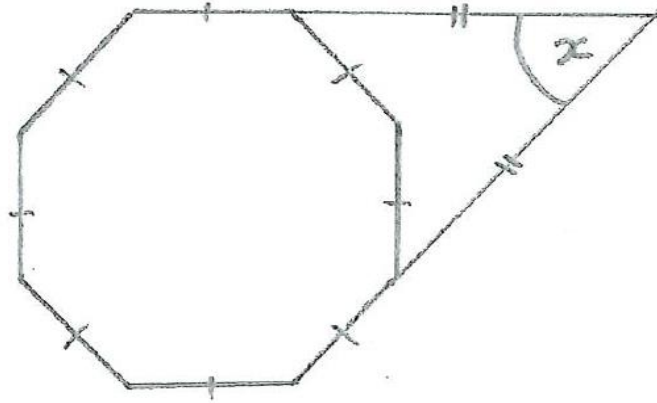
10. Grandfather is 63 years and 8 months old.
Father is 38 years and 4 months old
Mother is 35 years and 10 months old
Tilly is 12 years and 6 months old

a) How old was Father when Tilly was born?
..... (2)

b) How old was Grandfather when Father turned 10?
..... (3)

c) How old will Mother be when Tilly turns 21?
..... (3)

11. The diagram below shows a regular octagon with two of its sides extended to complete an arrow-head shape as shown.
 What is angle x ?



..... (5)

12. Solve for y :

a) $6y - 2 - 3(y - 4) = 13$

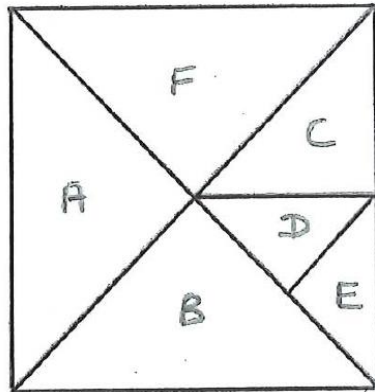
..... (3)

- b) Meg has w pounds and Faz has 6 pounds less than Meg. Together they have £30.

How much money does Meg have?

..... (3)

13. Write down the ratios of the following areas:



- a) B : A (1)
 - b) C : B (1)
 - c) E : A + B (1)
 - d) E : C + D (1)
 - e) C : whole square (1)
-

14. The lateness of 12 buses is recorded (in minutes):

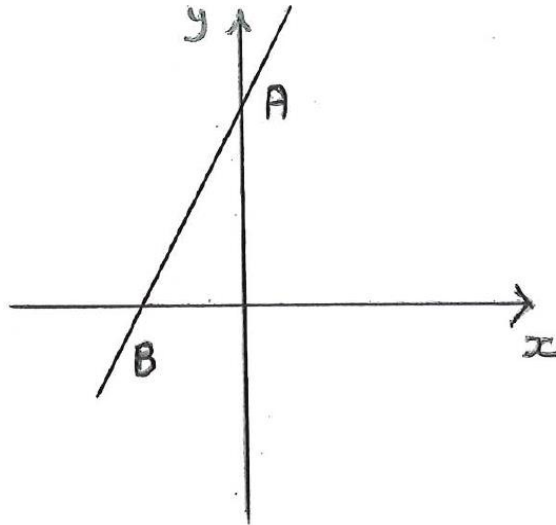
5 6 7 8 8 10 10 10 11 12 13 14

The lateness of 12 trains is also recorded.
 The range in lateness of the trains is 14 minutes and the mean lateness is 5 minutes.

Work out the mean and range for the buses and decide whether the buses or the trains are more reliable, giving your reasons.

.....
 (5)

15. The diagram shows a sketch of the straight line with equation $y = 2x + 6$

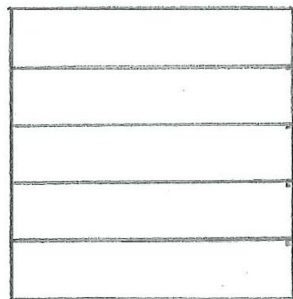


- a) Give the coordinates of point A : (..... ,) (2)
- b) Give the coordinates of point B : (..... ,) (2)
- c) What is the gradient of AB ? (1)
-

- 16.. The diagram shows a square which has been divided into five congruent (equal) rectangles.

The perimeter of each rectangle is 72cm.

What is the perimeter of the square?



..... (4)

17. Find the values of p and q if

$$2p + 3q = 12$$

$$5p + 4q = 23$$

$$p = \dots\dots\dots$$

$$q = \dots\dots\dots \quad (4)$$

END OF TEST

If you have checked your work and still have time, try the following:

1. Sixty 20p coins are lined up side by side.
Every second 20p coin is then replaced by a 10p coin.
Then every third coin is replaced by a 5p coin.
Finally every fourth coin is replaced by a 2p coin.

What is the final value of all the coins in the line?

2. Einstein is experimenting with two unusual clocks.
They both have 24-hour displays.
One clock goes at twice the normal speed.
The other goes backwards but at the normal speed.
Both clocks show the correct time at 13:00.

When next do the clocks agree? What is the correct time at this point?

3. Two sportsmen (Leo and Hal) and two sportswomen (Ava and Thea) sat at a table, one person on each of the four sides.
The sports are speed skating, skiing, hockey and snowboarding.

The skier sat at Thea's right hand.

The speed skater sat opposite Leo.

Ava and Hal sat next to each other.

A woman sat at the left hand of the hockey player.

Which was Ava's sport?