

# 11+ CEM Mathematics

## Paper 1

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# 11+ CEM Mathematics Paper 1

**Instructions:**

- You have 22 minutes to answer 27 questions. The questions are split into two sections.
  - You will have 10 minutes for the first section.
  - You will have 12 minutes for the second section.
- There will be an example question before the start of each section.
- Carefully read through each question before answering in your answering booklet.
- For Section 1, cross off and write your answers in the boxes provided.
- For Section 2, put a line through the correct answer by choosing one of the options A-E.
- Each question is worth 1 mark.


**Example:**

The **Correct** way to mark your answers on the answer sheet:



**Correct**

The **Incorrect** way to mark your answers on the answer sheet:



**Incorrect**

**Use a pencil** to mark your answers. **Rub out any errors**, do not cross them out.

**Please take care** when marking your answers on your answer sheets.

Make sure you mark your answer **on the line that matches the question number and mark only one answer per line.**

**Information about the test papers:**

- The page number is in the top right corner of each page.
- The title of each section is provided in the box at the top of each page.
- The timings for the different sections are shown on the example pages.

**Instructions at the bottom of the pages inform you:**

- If you can continue to the next page
- When you should wait for instructions before you turn the page
- When you have reached the end of a section.

**The following symbols and phrases are used on the test papers.**

**Symbol Description:**  
Time allowed for the section.



**Symbol Description:**  
Go to the next page.



**Symbol Description:**  
Do not turn the page until you are told to do so.



**Symbol Description:**  
STOP WORKING. You may check your work from this section only.



## Section 1

### Instructions

Answer the following questions in the time provided.

Write all answers in the answer booklet as shown. Make sure you cross off the digits **and** write each answer in the boxes provided for each question.

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### Example i.

i) What is  $20 - 5$ ?

The answer is **15**.

The answer 15 has been completed for you on your answer sheet.

The number '15' is written in the top boxes and the matching digits '1' and '5' are marked in the boxes below.

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### Example ii.

ii) What is  $2 \times 3$ ?

The answer is **6**.

Mark the boxes '0' and '6', then write '06' in the space provided in your answering booklet.

Remember, you **must** write the numbers in the spaces at the top **and** mark the matching digits below each number for every question.

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**You have 10 minutes to answer 12 questions.**



1) George wants to cycle a total of 30 km in September.  
If one circuit of his local park is 100m, how many circuits must George complete on average each day?

2) A cinema hall has 200 seats for the viewers.  
During one movie, there are 4 times as many occupied seats than empty seats.  
How many empty seats are there?

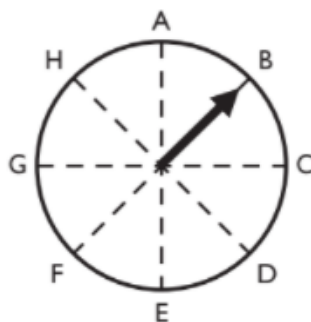
3) Three friends have 39 sweets in total.  
Aryan has  $S$  sweets, Beth has  $S + 4$  sweets, Cindy has  $3S$  sweets.  
How many sweets does Cindy have?

4) What is the answer to  $5 + 3 \times 12 - 7$ ?

5) Solve the equation and find the value of  $x$ .  
 $(x - 3)^2 = 64$

6) One bag carries 17 apples.  
How many identical bags are needed to carry 408 apples?

7) The arrow on the spinner is pointing to B.



The arrow is turned clockwise until it points to E.  
Through how many degrees has the arrow turned?



8) The length of a square is quadrupled.  
How many times greater is the area of the new square compared to the original square?

9) There are 25 children in a class. 13 of the children are girls.  
What percentage of the children in the class are boys?

10) From a 1.44 m rope, how many 24cm pieces can be cut?

11) A garden measures 8m x 12m.  
Every 4 metres of fencing costs £15.  
How much does it cost to fence the edges of the garden?

12) What is 35% of 280?

**End of Section 1. Remember to check your work.**



## Section 2

### Instructions

For the following questions, you have 5 options (A-E). Mark your chosen answer for each question in your answering booklet.

### Example iii.

iii) What is  $20 + 10$ ?

A	B	C	D	E
30	2	20	40	10

The answer is **30**.

The answer **A** has been marked for you on your answer sheet.

### Example iv.

iv) Which of the following numbers is the largest?

A	B	C	D	E
6	$\frac{1}{2}$	7.5	20	100

The answer is **100**.

Mark **E** on your answer sheet.



**You have 12 minutes to answer 15 questions.**



1) Which of the following is equivalent to  $7a + 14b$ ?

A	B	C	D	E
$7ab$	$2(3a + 7b)$	$7(a + 2b)$	$14a + 7b$	$21ab$

2) A hardback book costs £1.40 and a paperback book costs 79p. If Ben purchases 4 hardback books and 3 paperback books, how much change will he receive from £10?

A	B	C	D	E
£1.97	£2.03	£3.03	£5.99	£7.97

3) The length of 5 chairs and 3 tables is 7.6m. If a chair is 0.8m long, how long is a table?

A	B	C	D	E
2.4m	5.2m	6.7m	2.5m	1.2m

4) Which of the following has the lowest value?

A	B	C	D	E
25% of 30	10% of 70	20% of 40	50% of 15	60% of 12

5) Lily's job starts at 8:45am. During the day there are 5 meetings of 30 mins each, a lunch break of 1 hour 30 mins and 3 breaks of 20 minutes. She also must complete a project which will take 3 hours. At what time will she finish her work and go home?

A	B	C	D	E
16:00	16:30	16:45	17:00	18:00

6) Mr Smith cuts a pizza in half and then cuts each half into thirds. Finally, he cuts each piece in half. How many pieces has the pizza been cut into?

A	B	C	D	E
9	10	11	12	14



7) A rectangle has a perimeter of 220cm. The length is 30cm greater than the width. What is the size of the shorter side of the rectangle?

A	B	C	D	E
35cm	40cm	50cm	55cm	70cm

8) Lily starts at 26 and counts backwards in steps of 6. What is the first negative number that she reaches?

A	B	C	D	E
-6	-4	-3	-2	-1

9) Through how many degrees does the hour hand of a clock turn from 4:00 to 7:00?

A	B	C	D	E
30	45	90	120	150

10) Jeff drives at a speed of 30 miles per hour. If it takes him 15 minutes to drive to work every day, how far is his office from his house?

A	B	C	D	E
4 miles	5.5 miles	6 miles	7.5 miles	10 miles

11) In which box does 91 belong?

	Even numbers	Odd numbers
Multiples of 11	Box W	Box X
Multiples of 13	Box Y	Box Z

A	B	C	D	E
Box W	Box X	Box Y	Box Z	None





12) Linda buys milk and dark chocolate. She purchases 4 boxes of milk chocolates for M pounds each. One box of dark chocolates costs D pounds. There are 15 chocolates in each box and Linda buys 45 dark chocolates. Which of the following statements express the total cost of the boxes of chocolate Linda buys?

A	B	C	D	E
$3D + 4M$	$4D + 3M$	$15M + 4D$	$8D + 3M$	$6D + 4M$

13) I have a jug of apple juice. One portion of juice is the same as  $\frac{1}{20}$  of the jug. I give my guests one portion of apple juice each. After serving all guests, 50% of the juice remains in the jug. How many guests do I have?

A	B	C	D	E
7	8	10	12	15

14) John owns 5 guitars and 3 violins. He purchases 3 more of each instrument. What is the new ratio of guitars to violins?

A	B	C	D	E
2:1	4:3	3:4	6:5	5:6

15) N is a positive whole number divisible by 2, 3 and 4. Which of the following is also divisible by 2, 3 and 4?

A	B	C	D	E
$N + 12$	$N + 6$	$N + 4$	$N + 5$	$N + 8$

**End of Section 2. Remember to check your work.**

