

12+ Mathematics Examination 2019



ST ALBANS SCHOOL

12+ Mathematics Examination

Remember that you must **not** use a calculator to answer any question in this examination, but it is very important to show your working as you may get marks for this.

You do not need any geometry equipment.

The maximum marks for each question are shown in brackets.

There are 19 pages of questions and a spare page at the end if you need it.

The maximum total for this paper is 100 marks.

You have 60 minutes for this paper.

Name Date of Birth

Total
<hr/>
100

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1. (a) Work out $98 + 35$

..... [2]

(b) Calculate $405 - 28$

..... [2]

(c) Work out 12×45

..... [2]

(d) Calculate $768 \div 8$

..... [2]

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(e) Write the following fraction in its simplest form .

$$\frac{9}{54}$$

..... [1]

(f) Write the following fraction as a percentage.

$$\frac{3}{5}$$

..... [1]

(g) Write 36 % as a fraction in its simplest form.

..... [1]

(h) Write the following fraction as a decimal.

$$\frac{7}{20}$$

..... [2]

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2. Work out the following:

(a) $80 - 6^2 \div 4$

..... [2]

(b) $50 - 3 \times 8 - (13 + 2)$

..... [3]



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3. Calculate the following, giving your answer as a fraction in its lowest terms:

(a) $1\frac{4}{7} + \frac{5}{6}$

..... [3]

(b) $1\frac{3}{5} \times \frac{5}{7}$

..... [2]

(c) $\frac{4}{9} \div \frac{7}{36}$

..... [2]

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4. (a) Show clearly that $478 \times 12 = 5736$.

..... [2]

(b) Use your answer to part (a) to work out the following (you should not need to do any more long multiplication or division).

(i) $5736 \div 478$

..... [1]

(ii) $5736 \div 24$

..... [2]

(iii) 47.8×1.2

..... [2]



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5. What is the date of the middle of this year (2019)?

..... [2]

6. By rounding each of the numbers in this calculation to one significant figure, work out an **approximate** value for the answer.

$$\frac{9.6^2}{0.47 \times 80.39}$$

..... [3]

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7. In this question $x = 2, y = 6, z = -4$

Work out the following, simplifying your answers fully.

(a) $xy + yz$

..... [2]

(b) $\frac{x - y}{x + y}$

..... [2]

(c) xz^2

..... [2]



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8. (a) Work out 35 % of £740.

..... [2]

(b) Peter bought a painting for £740. He made a profit of 35 % when he sold it.

For how much did Peter sell his painting?

..... [1]

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9. Simplify the following expressions.

(a) $7a - 3b - 12a + 7b$

..... [1]

(b) $5c \times -dc^2$

..... [2]

(c) $(2e)^3 - 2e^3$

..... [2]

(d) $\frac{3x^2 + 6x}{3x}$

..... [2]



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10. Solve the following equations to find the value of x .

(a) $5x + 13 = 58$

..... [2]

(b) $\frac{x}{3} = 9$

..... [1]

(c) $10x - 20 = 6x + 4$

..... [2]

(d) $3(27 + 2x) = 51$

..... [3]

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11. In the 4 by 4 grid below, each letter represents a different number.

The row and column totals are given.

Find the value of each letter.

A	B	C	6	16
C	B	A	A	13
B	A	C	D	18
A	A	B	C	13
13	16	12	19	

A.....

B.....

C.....

D..... [4]



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12. The number 48 written as a product of its prime factors is $2 \times 2 \times 2 \times 2 \times 3 = 2^4 \times 3$.

(a) Write 270 as a product of its prime factors.

..... [3]

(b) Use your answer to (a) and the information given in the question to write down the lowest common multiple of 48 and 270 as a product of prime factors.

Do NOT work out 48×270

..... [2]

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13. Laura decided to check the spelling on all 24 pages of her coursework.
The table below gives information about the number of spelling mistakes on each page.

Number of spelling mistakes on the page	Number of pages
0	10
1	5
2	4
3	3
4	2

- (a) What is the median number of spelling mistakes per page?

..... [2]

- (b) What is the modal number of spelling mistakes per page?

..... [1]

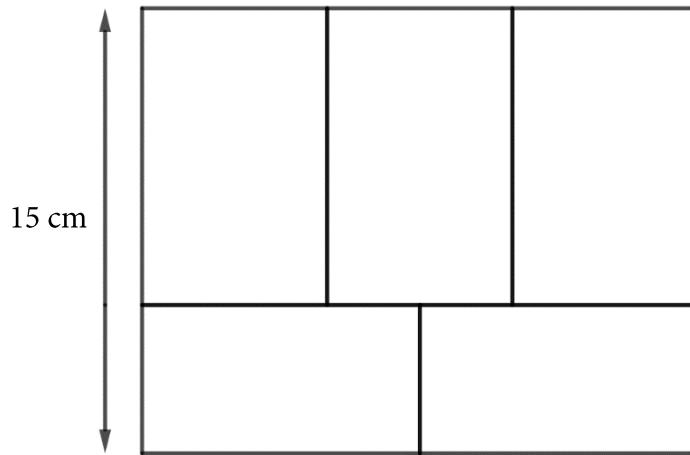
- (c) (i) How many spelling mistakes are there altogether on the 24 pages of the coursework?

..... [2]

- (ii) Calculate the mean number of spelling mistakes per page.

..... [2]

14. Five identical rectangles fit together as shown.



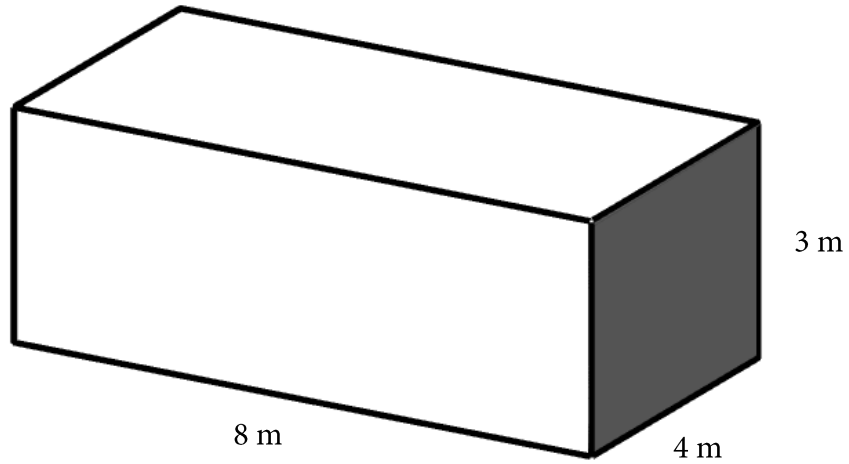
Not drawn accurately

What, in cm^2 , is the total area that they cover?

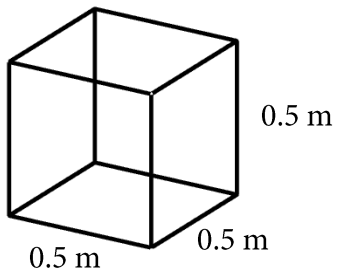
..... [3]

15. Ben fills a container with small cubes.

The container is a cuboid, shown below.



Each small box is a cube of side 0.5 metres.



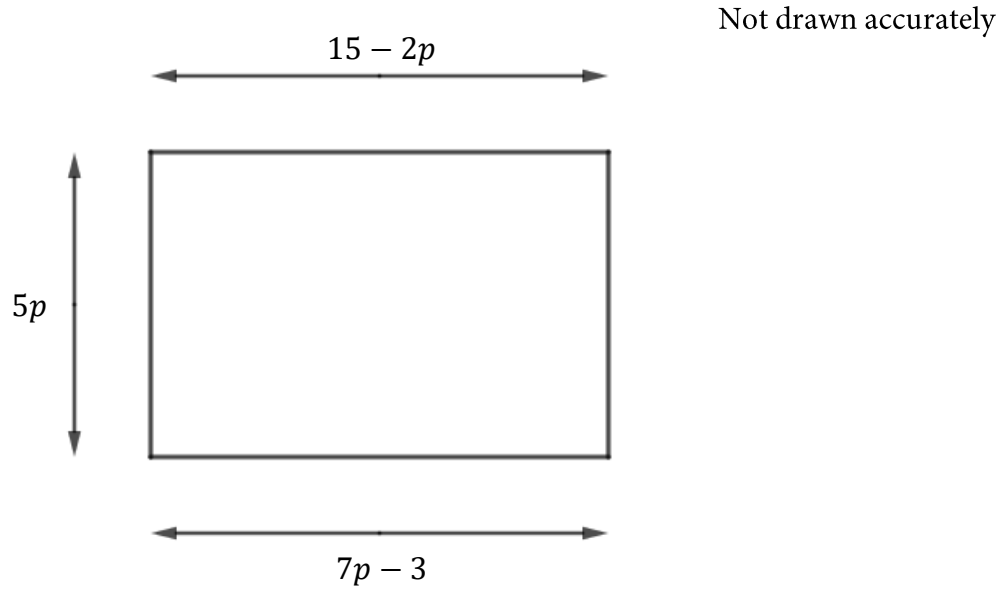
Work out how many small boxes will fit exactly into the container.

..... [3]



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16. Look carefully at the information displayed on the rectangle below.



(i) Write down an equation in terms of p and then solve it to find the value of p .

..... [3]

(ii) Use your value of p to calculate the length of the perimeter of the rectangle.

..... [2]

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17. Write down a list of six whole numbers in which each number is 4 more than the previous number, and all six numbers add up to 90.

..... [4]

18. Lampposts are evenly spaced along a road.

If the distance between the first post and the fourth is 120 metres, find the distance between the fourth and the ninth.

..... [4]



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19. It takes Tom 2 hours to paint a room, and it takes Bill 4 hours to paint the same room.

How long would it take them if they worked together?

..... [4]

This is the end of the Examination.

**There is additional answer space below and on the back page
(please write the question number clearly if you use this space)**

Spare Page