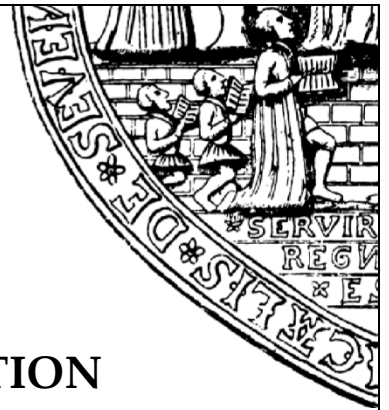


SEVENOAKS SCHOOL



YEAR 9 (13+) ENTRANCE EXAMINATION

April 2024
for entry in September 2025

MATHEMATICS

Your Name: _____

Your School: _____

Time allowed: 1 hour

Equipment needed: Pen, pencil, eraser.

Information for candidates:

1. Calculators, rulers and protractors are NOT allowed.
2. Write your name and school on this page.
3. Write your answers on the question paper in the space provided.
4. Some of the later questions might be easier than the earlier questions, so do not spend too long on any question. You can always go back.
5. You should not need to do any long calculations. If you find yourself doing long calculations, you might be able to find a better way.
6. Some questions might rely on answers to previous questions.
7. Read the question carefully. 'Write down' means something different to 'calculate' or 'find'.
8. There are 60 marks in total available for this paper.
9. Show all your working. You may be awarded marks for correct working even if your final answer is incorrect, and a correct answer unsupported by correct working may not receive full marks.

1. [Total marks: 8]

a. Calculate the value of each of the following:

(i) $-12 + 3 \times 10$

(ii) $-12 \div (2^2 - (-2))$

_____ [1]

_____ [2]

(iii) $0.81 \div (1 + (-0.7))$

_____ [2]

b. There are four rooms, A, B, C and D , in a house. The total area of rooms A and B is equal to the total area of rooms C and D .

Given that $Room A$ is $10\frac{1}{2} \text{ m}^2$, $Room B$ is $24\frac{2}{3} \text{ m}^2$ and $Room C$ is $18\frac{5}{6} \text{ m}^2$, find the area of room D .

_____ [3]

2. [Total marks: 8]

a. Find the value of a if the ratio $a:400 = 6:25$.

_____ [2]

b. A certain amount of money is shared between Will and Phyllis in the ratio 5:9. If Will gets £44 less than Phyllis, find the total amount of money that is shared between them.

_____ [3]

c. The diameter of the wheel of a car is 30 cm. *You may assume that $\pi = 3$ for this question.*

(i) Find the distance the car travels in one revolution of the wheel.

_____ [1]

The car travels at an average speed of 36 m/s.

(ii) Find the number of revolutions made by the wheel per minute.

_____ [2]

3. [Total marks: 6]

a. Express $5\frac{1}{25}\%$ as a fraction.

_____ [2]

b. An elastic band, which is 72 cm long, is stretched to 90 cm. Find the percentage increase in its length.

_____ [2]

c. The number 2400 is first increased by 30%. The value obtained is next decreased by 30%. Find the final number.

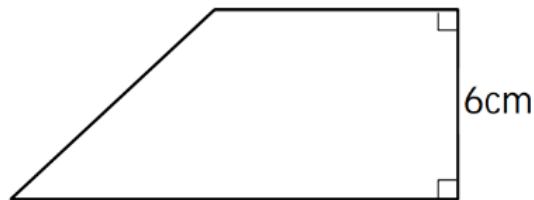
_____ [2]

4. [Total marks: 6]

- a. The area of a rectangle is 750 cm^2 and its length is 30 cm . Find the perimeter of the rectangle.

_____ [2]

- b. The area of the following trapezium is 36 cm^2 .



- (i) If the lengths of the parallel sides are $x \text{ cm}$ and $y \text{ cm}$, find the value of $x + y$.

_____ [2]

- (ii) If the value of x is twice the value of y , find the values of x and y .

_____ [2]

5. [Total marks: 7]

- a. There are 2 apples, some oranges, and some pears in a basket. A fruit is picked at random from the basket. The probability that the fruit picked is an orange is $\frac{3}{10}$. The probability that the fruit picked is a pear is $\frac{3}{5}$.

(i) What is the probability that the fruit picked is an apple?

_____ [2]

(ii) Find the number of oranges and the number of pears in the basket.

_____ [2]

- b. There are 23 boys and 35 girls on a school team. After q boys and $(q + 4)$ girls leave school at the end of the year, the probability of selecting a boy at random to represent the school becomes $\frac{2}{5}$. Find the value of q .

_____ [3]

6. [Total marks: 9]

a. Write down the **next two** terms in each of the following sequences:

(i) 1, 2, 5, 10, 17, ...

(ii) 4, 16, 36, 64, 100, ...

_____ [1]

_____ [1]

b. Consider the following sequence 32, 25, 18, 11, 4, ...

(i) Find an algebraic expression for the n th term in the sequence.

_____ [2]

(ii) **Explain** whether -661 is in the sequence or not.

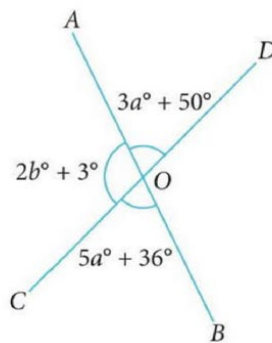
_____ [2]

c. The sum of three **consecutive** odd numbers is 465. Find the smallest of these numbers.

_____ [3]

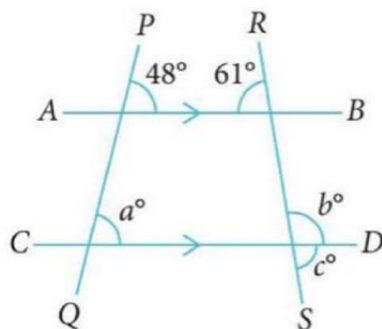
7. [Total marks: 7]

a. In the figure below AOB and COD are straight lines. Calculate the values of a and b .



_____ [3]

b. In the figure below, AB and CD are parallel. Calculate the values of a , b and c .



_____ [4]

8. [Total mark 9]

a. Simplify each of the following expressions:

(i) $10x + 3x - 5x$

_____ [1]

(ii) $2b^2 + 8ab - 4b(2a - b)$

_____ [2]

b. Subtract the sum of $w^2 - 10w + 25$ and $3w^2 - 7w$ from the product of $4 - w$ and $2 - 5w$.

_____ [3]

c. Express $\frac{5(p-q)}{2} - \frac{2q-p}{14} + \frac{2(p+q)}{7}$ as a fraction in its simplest form.

_____ [3]