

Secondary 3 Mathematics 1st Term Pre-exam Structured Questions

Time allowed: 45 minutes

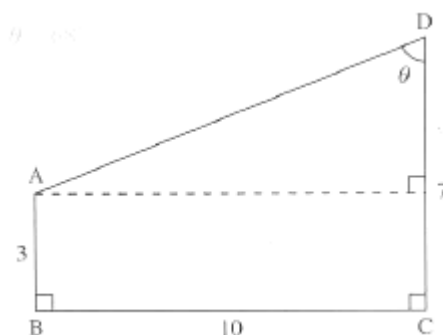
Total Mark: 50

SECTION A: (12 marks)

1. Simplify $\sqrt{3}(2 - \sqrt{12}) + \sqrt{27}$.

(2 marks)

2. In the figure, find the value of θ .



(2 marks)

3. The line joining the points $A(-1, 1)$ and $B(0, -2)$ is reflected along the vertical line through $(1, -1)$ to form the line joining A' and B' . What are the coordinates of A' and B' ?

(2 marks)

4. (a) Convert AF_{16} into a decimal number.
(b) Hence, convert AF_{16} into a binary number.

(2 marks)

5. Simplify $2.21 \times 10^{-7} + 1.3 \times 10^{-9}$ and express the result in scientific notation.

(2 marks)

6. There are 6 questions in a Mathematics test paper. The results of a class of students are as follows:

Number of correct answers	0	1	2	3	4	5	6
Number of students	5	4	5	6	11	6	3

Find the median and mode number of correct answers.

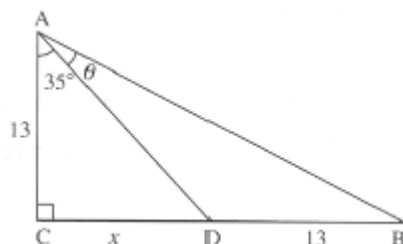
(2 marks)

SECTION B: (18 marks)

7. Rationalize $\frac{4}{1-\sqrt{3}-\sqrt{2}}$.

(4 marks)

8. The figure shows $\triangle ABC$ with $\angle C = 90^\circ$, $AC = DB = 13$ and $\angle CAD = 35^\circ$. Find x and θ .



(4 marks)

9. Simplify

(a) $(s^{-3}t^4) \div \left(\frac{s}{t}\right)^{-6}$

(b) $\frac{8^{n+1} - 8^n}{2^{3n-1}}$

(5 marks)

10. In $\triangle ABC$, $\angle A = 23.6^\circ$ and $\angle B = 45.4^\circ$ (correct to the nearest 0.2°).

(a) Find the maximum absolute error of the size of $\angle C$.

(b) Hence, find the percentage error of the size of $\angle C$, giving the answers correct to 3 significant figures.

(5 marks)

SECTION C: (20 marks)

11. In a Mathematics test, the results of Classes 3A and 3B with 40 students per class are as follows:

Marks	40 – 49	50 – 59	60 – 69	70 – 79	80 – 89	90 – 99
Number of F.3A students	4	9	12	8	6	1
Number of F.3B students	4	7	x	y	7	0

- (a) Find the mean mark of F.3A.
- (b) What is the modal class of F.3A?
- (c) Given that the mean mark of F.3B is higher than that of F.3A by 0.75. Find the values of x and y .
- (d) Find the mean mark of the 80 students in F.3A and F.3B.
- (e) The teacher in F.3B has wrongly written down the mark of a student as 67. The true mark that the student gets is 76. What is the modal class of F.3B?

(2 + 1 + 3 + 2 + 2 marks)

12. Three of the vertices of trapezium ABCD are $A(-3, -4)$, $B(6, -4)$ and $D(-2, 1)$. It is given that $AB \parallel CD$.

- (a) Write down the y -coordinate of C.
- (b) If the area of trapezium ABCD is 35 sq. units, find the x -coordinate of C.
- (c) If the trapezium is rotated about O anticlockwise by 90° to form another trapezium $A'B'C'D'$, write down the coordinates of A' , B' , C' and D' .

(1 + 5 + 4 marks)

End of Paper

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