KWAZULU-NATAL PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

NATIONAL SENIOR CERTIFICATE

GRADE 10

MATHEMATICS

COMMON TEST

SEPTEMBER 2022

Stanmorephysics.com

MARKS: 75

TIME: 1½ hours

This question paper consists of 7 pages.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of **5** questions. Answer ALL the questions.
2. Clearly show ALL calculations, diagrams, graphs, et cetera that you have used in determining your answer.
3. You may use an approved scientific calculator (non-programmable and non- graphical), unless stated otherwise.
4. Answers only will not necessarily be awarded full marks.
5. If necessary, round off answers to TWO decimal places, unless stated otherwise.
6. Diagrams are NOT necessarily drawn to scale.
7. Number the answers correctly according to the numbering system used in this question paper.
8. Write neatly and legibly.

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QUESTION 1

1.1 Tyler decides to purchase a sound system which costs R 7999 on a hire purchase agreement.

1.1.1 If Tyler pays a 11% deposit, calculate the balance after Tyler has paid the deposit. (2)

1.1.2 The store charges Tyler 20% interest per year, with the loan payable over 4 years. Calculate the total amount that he will have to pay back. (3)

1.1.3 Tyler is also required to pay a monthly insurance of R30 and an administration fee of R12. How much will Tyler's monthly repayments be? (2)

1.2 On a trip to Florida, Akwande booked into a hotel for four nights. The exchange rate at that time was \$1 = R16,77. The cost per night was \$450.

How much did she spend, in Rands, for the four nights? (2)

1.3 After 7 years, an investment increased to R95 798,35. If the interest rate was 8,25% per annum, compounded annually, calculate the amount initially invested. (3)

1.4 Lynda deposits R 4500 into a savings account. At the end of 4 years she adds a further amount of R 2500 into the savings account. The interest paid on the savings is 7,5% p.a. compounded annually.

1.4.1 Calculate how much money is in the account at the end of 4 years, immediately after the second deposit. (3)

1.4.2 Calculate how much there will be available in the savings account 10 years after the first deposit. (3)

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QUESTION 2

2.1 A bag contains yellow and blue marbles of equal size. The probability that a marble chosen at random will be yellow is $\frac{1}{6}$.

2.1.1 If it is given that there are 102 marbles in the bag, how many of them will be blue? (2)

2.1.2 If there are 26 yellow marbles in the bag, how many of them will be blue? (2)

2.2 Complete the following:

2.2.1 For exhaustive events: $P(A \text{ or } B) = ...$ (1)

2.2.2 For mutually exclusive events: $P(A \text{ and } B) = ...$ (1)

2.3 Given that:

- A and B are inclusive events
- $P(A \text{ or } B) = 0,9$; $P(A) = 0,6$ and $P(B) = 0,4$

Calculate $P(A \text{ and } B)$. (3)

2.4 205 Grade 10 students have a choice of 2 sports, soccer (S) and hockey (H).

- 86 students play soccer (S)
- 64 students play hockey (H)
- 63 play neither of the 2 sports
- Let the number of students that play BOTH soccer (S) and hockey (H) be *x*.

2.4.1 Draw a Venn diagram to represent the above information. (3)

2.4.2 Calculate how many students play both soccer and hockey. (2)

2.4.3 Determine the probability that a learner chosen at random plays hockey only. (2)

2.5 Given: A and B are two mutually exclusive events with $P(A) = 0,5$ and $P(B) = 0,4$.

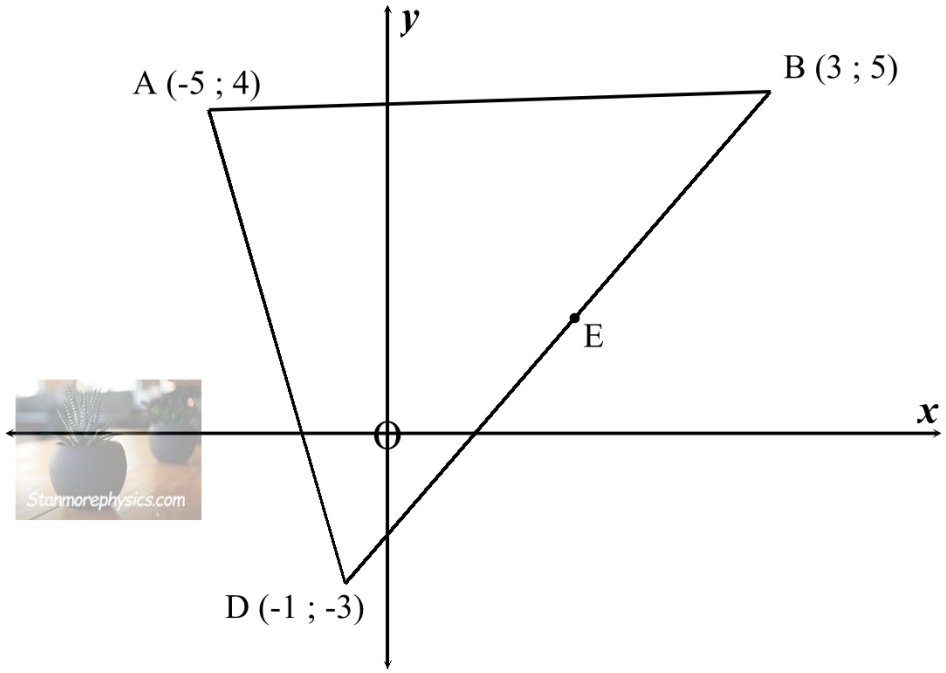
Determine $P(B')$. (1)

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QUESTION 3

The coordinates of ΔABD are given as: $A(-5\,;\,4)$, $B(3\,;\,5)$ and $D(-1\,;-3)$ below.
E is the midpoint of BD.



3.1 Calculate the length of BD. Leave your answer in surd form. (2)

3.2 Determine the coordinates of E, the midpoint of BD. (2)

3.3 Show that $AE \perp BD$. (4)

3.4 Determine the equation of the line parallel to BD and passing through A. (3)

3.5 Calculate the area of ΔABD. (3)

3.6 Determine the coordinates of a point C such that the quadrilateral ABCD is a rhombus. (2)

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QUESTION 4

4.1 The data below represents the daily rainfall (in mm) during the month of September in KwaZulu-Natal.

RAINFALL (mm)	FREQUENCY	MIDPOINT	MIDPOINT × FREQUENCY
$0 < x \leq 20$	**A**	10	20
$20 < x \leq 40$	4	30	120
$40 < x \leq 60$	5	**B**	250
$60 < x \leq 80$	6	70	420
$80 < x \leq 100$	8	90	720
$100 < x \leq 120$	3	110	**C**
$120 < x \leq 140$	2	130	260

4.1.1 Determine the missing values in the table above. (3)

4.1.2 Use the table above to calculate the estimated mean rainfall. (3)

4.1.3 Represent the data on a histogram. (3)

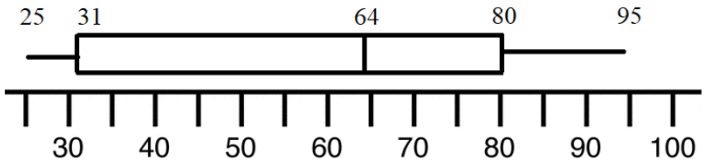
4.1.4 In which class interval will the following be found?

(a) the median (1)

(b) the 75th percentile (1)

(c) the mode (1)

4.2 The box and whisker plot below shows the test results of a grade 10 class (in percentages.



Use the box and whisker plot above to determine:

4.2.1 the lowest and highest marks obtained by students in the test. (1)

4.2.2 what percentage of the class achieved above 31%. (1)

4.2.3 the median mark. (1)

4.2.4 what percentage of the class achieved between 64% and 80%. (1)

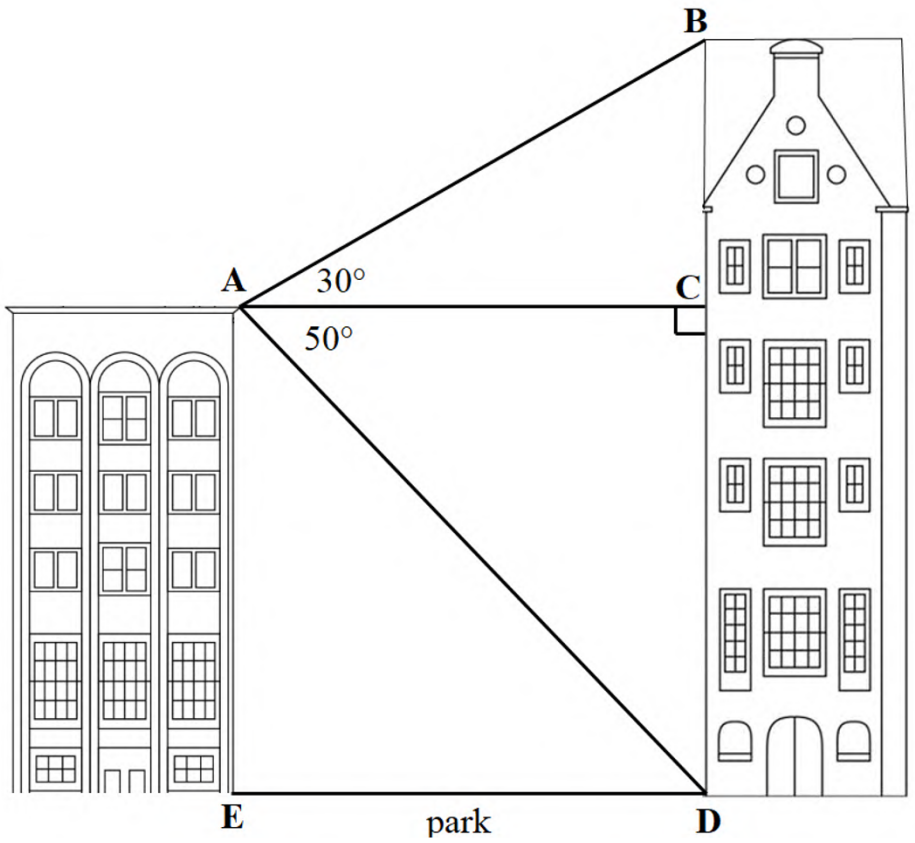
4.2.5 the interquartile range. (2)

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QUESTION 5

Two buildings are 45 metres apart (length ED), separated by a park. A person on the top of the shorter building, at point A, calculates the angle of elevation of B from A to be $30°$ and the angle of depression of D (the base of the taller building) from A to be $50°$.



5.1 Determine the size of $A\hat{D}E$. (1)

5.2 Calculate the length of BD, the height of the taller building. (5)
[6]

TOTAL [75]

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