GRADE 10

MATHEMATICS

NOVEMBER PAPER 2

2022

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EXAMINER: PHOENIX CLUSTER **MODERATOR:** PHOENIX CLUSTER

MARKS: 75

DATE: 16 NOVEMBER 2022

TIME: 1½ HOURS

INSTRUCTION TO LEARNERS:

- This question paper consists of **SEVEN pages** and **FIVE questions**. Answer ALL the questions.
- Number answers correctly according to the numbering system used in this question paper.
- You may use an approved non-programmable calculator
- Round off all answers appropriately according to the given context.
- Show ALL calculations clearly.
- Indicate units of measurement, where applicable.
- Write neatly and legibly.

QUESTION 1 [11 MARKS]

1.1 The number of absent learners in grade 10 in Amandlethu High School for the first term was recorded and is shown in the table below:

Days absent	Frequency
$0 \leq x < 4$	37
$4 \leq x < 8$	23
$8 \leq x < 12$	9
$12 \leq x < 16$	17
$16 \leq x < 20$	5
$20 \leq x < 24$	1

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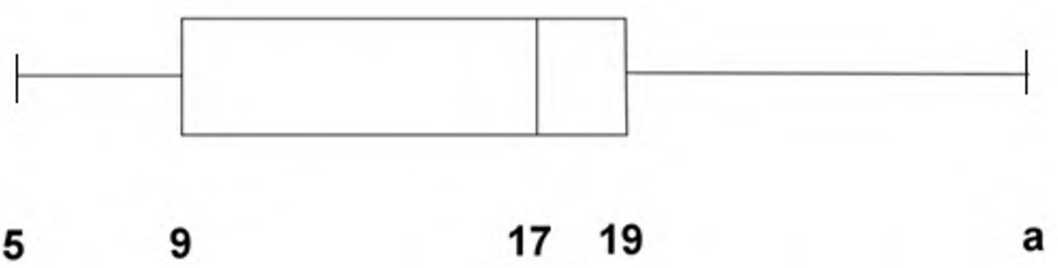
1.1.1. How many grade 10's are at Amandlethu High? (1)

1.1.2. Calculate the estimated mean of the number of days during which the grade 10's were absent during the first term. (3)

1.1.3 Give the modal interval. (1)

1.1.4 In which interval is the 70th percentile? (2)

1.2 A second-hand car dealer's sales per month for March 2013 to February 2014 is given by the box and whiskers diagram below.



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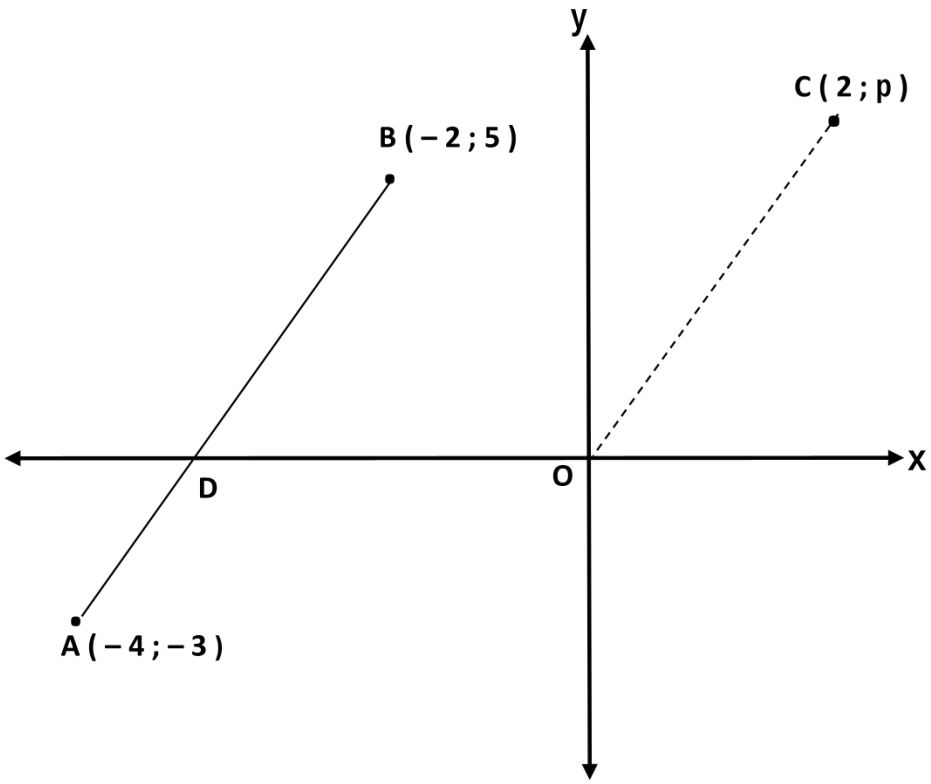
1.2.1 If the range of the sales is 25, calculate the value of a. (1)

1.2.2 If he sells less than 9 cars per month, his profit is not enough to cover all his expenses. How many months was his profit not enough? (2)

1.2.3 Approximately what percentage of the year did he sell more than 19 cars a month? (1)

QUESTION 2 [12 MARKS]

In the diagram below, A(– 4 ; – 3) and B (–2 ; 5) are two points in a Cartesian plane



Determine:

2.1. The length of AB (leave the answer in surd form) (3)

2.2. The gradient of AB (3)

2.3. The co-ordinates of M, the midpoint of AB (2)

2.4. The value of p if line OC is parallel to AB, where O is the origin and C is the point (2 ; p). (4)

QUESTION 3 [21 MARKS]

3.1. If $\mathrm{A} = 129°$ and $\mathrm{B} = 51°$, determine:

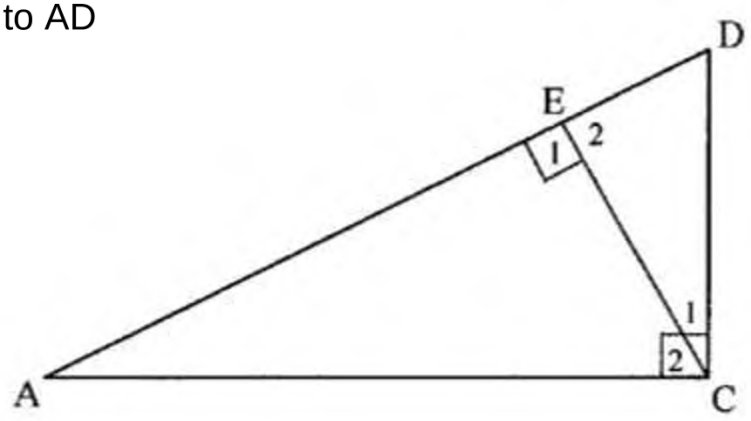
3.1.1. $\sin(2\mathrm{A} + \mathrm{B})$ (2)

3.1.2. $\tan^2(\mathrm{A} - \mathrm{B})$ (2)

3.2. Determine θ if: $0° \leq \theta \leq 90°$

3.2.1. $\cos(3\theta + 10°) = \tan 23°$ (3)

3.3. In the diagram below, Δ ACD is right-angled at C. E lies on AD such that CE is perpendicular to AD

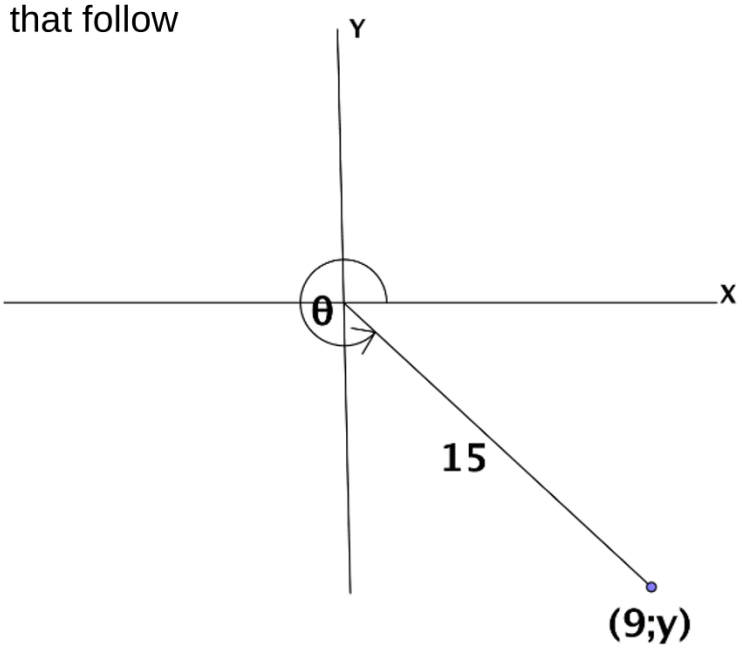


3.3.1. Write down the ratio for cos D in Δ ACD (1)

3.3.2. Write down the ratio for cos D in Δ CED (1)

3.3.3. If AD = 13 units and DC = 5 units, calculate the length of ED. (2)

3.4. With the aid of the diagram below and WITHOUT using a calculator, answer the questions that follow



Calculate the value of the following:

3.4.1. y (2)

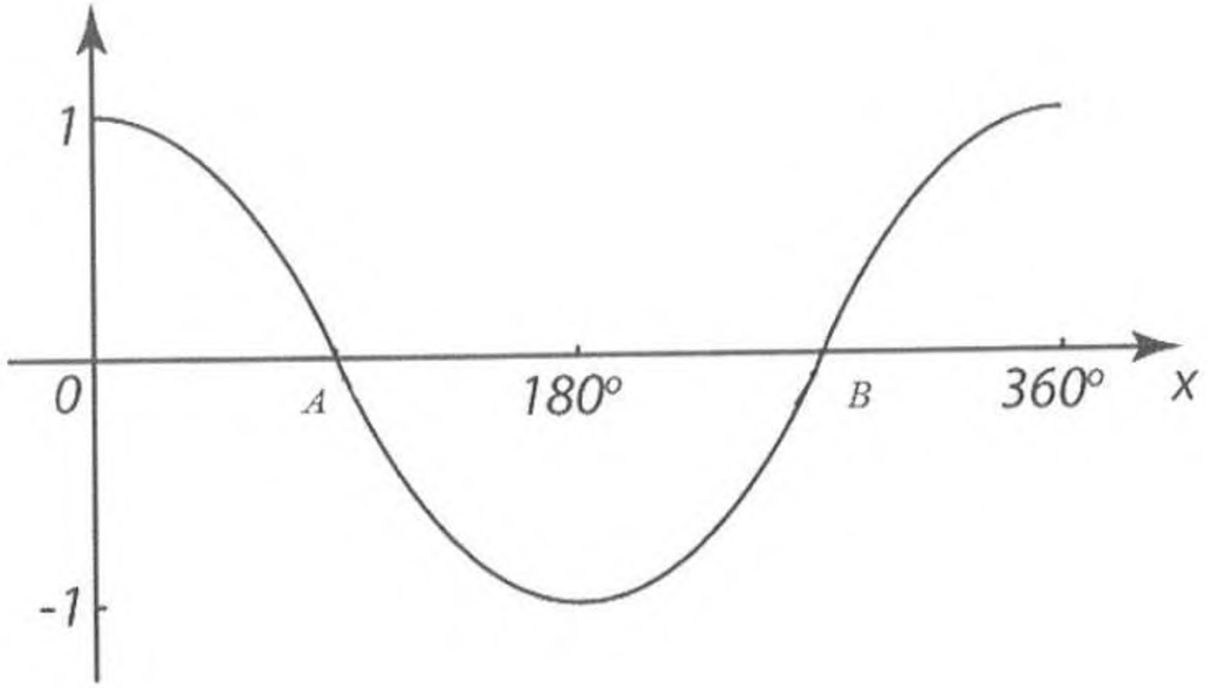
3.4.2. $5\sin\theta + 9\tan^2\theta$ (3)

3.5. Simplify WITHOUT using a calculator:

$$\cos^2 45°.\sin 90° + \tan 60°.\cos 30°$$ (5)

QUESTION 4 [9 MARKS]

4. The graph of f is drawn below: $y = acosx$



4.1. Determine the equation of f (1)

4.2. Write down the co-ordinates of A and B (2)

4.3. State the range of f (1)

4.4. Write down the period of f (1)

4.5. Determine the value(s) of x for which $f(x) \leq 0$ (2)

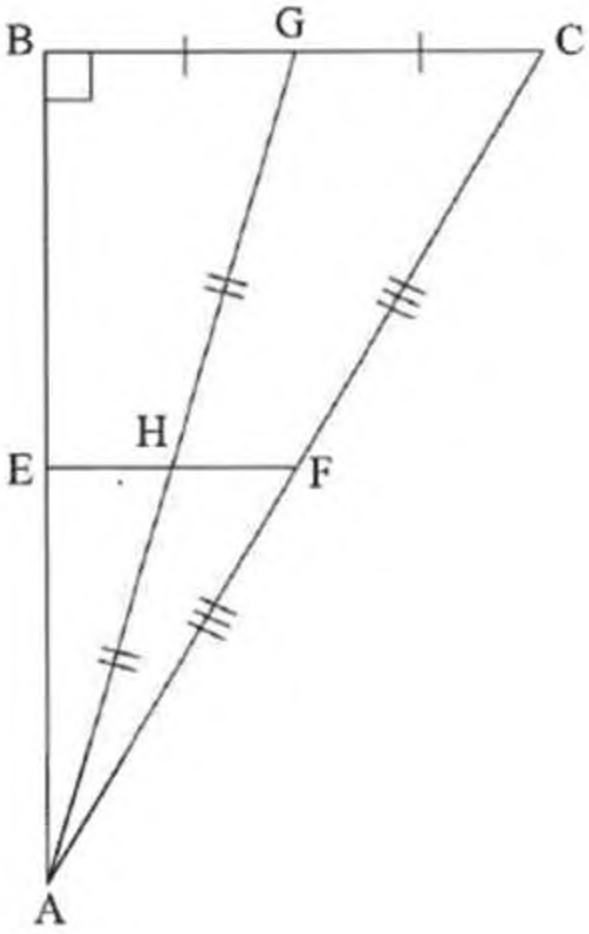
4.5. Determine the equation of $g(x)$ if g is the graph of f reflected across the x – axis and shifted 2 units down. (2)

QUESTION 5 [22 MARKS]

5.1. Complete the statement so that it is TRUE

The line drawn from the midpoint of the one side of a triangle, parallel to the second side, ... (1)

5.2. In the figure below Δ ABC is right-angled at B. F and G are the midpoints of AC and BC respectively. H is the midpoint of AG. E lies on AB such that FHE is a straight line.

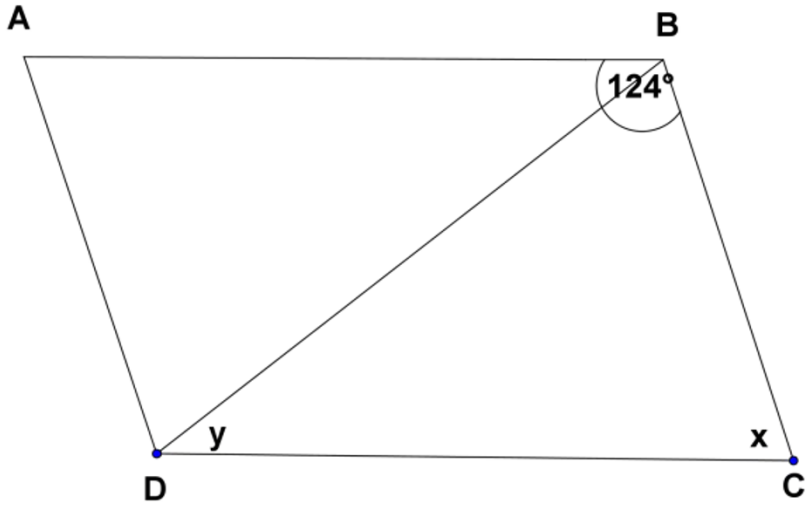




5.2.1. Prove that E is the midpoint of AB. (3)

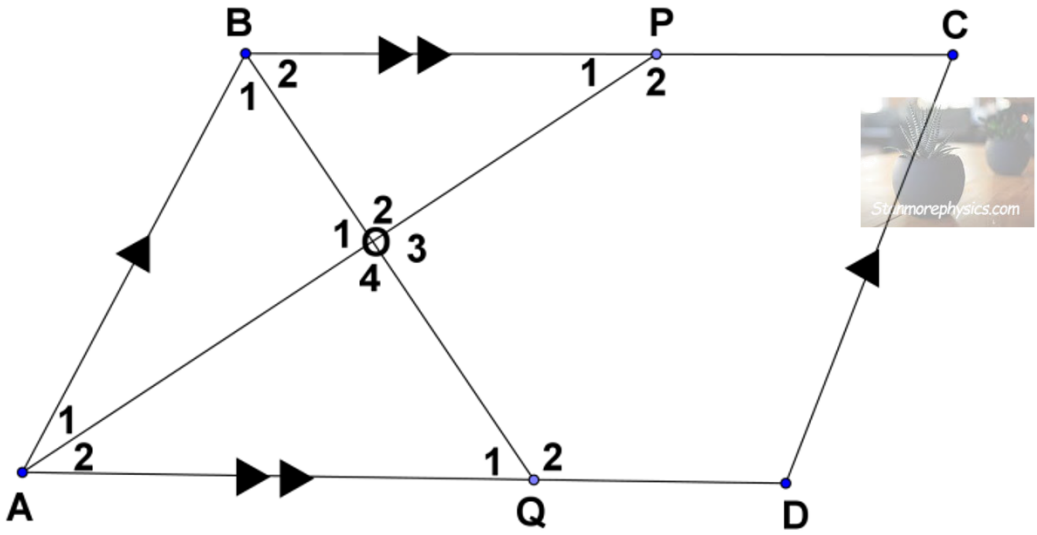
5.2.2. If EH = 5 cm and the area of Δ AEH = 15 cm^2,calculate the length of AB (3)

5.3. Use Rhombus ABCD below to determine with reasons the values of x and y in the following figure: (3)



5.4. In the diagram below ABCD is a parallelogram. The bisector BQ, of $\angle B$ meets AD in Q and the bisector AP of $\angle A$, meets BC in P.

AP and BQ intersect at O.



Prove that:

5.4.1 $AO \perp BQ$ (4)

5.4.2 ABPQ is a rhombus. (6)

5.4.3 If $AQ = 2\sqrt{10}$, determine the length of DC. (2)

END OF PAPER