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Province of the
EASTERN CAPE
EDUCATION

EC CURRICULUM: FET MATHEMATICS, MATHEMATICAL LITERACY AND TECHNICAL MATHEMATICS

NATIONAL SENIOR CERTIFICATE

GRADE 12

MATHEMATICS TOPIC TEST 4 OF 2020: EUCLIDEAN GEOMETRY

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MARKS: **50**

TIME: **1 Hour Strictly!**

This question paper consists of 13 pages, including ANSWER SHEETS.

INSTRUCTIONS AND INFORMATION

Read the following instructions carefully before answering the questions.

1. This question paper consists of 3 questions. Answer ALL questions in ANSWER SHEETS.

2. Clearly show ALL calculations, diagrams, graphs, et cetera that you have used in determining your answers.

3. Answers only will NOT necessarily be awarded full marks.

4. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.

5. If necessary, round off answers to TWO decimal places, unless stated otherwise.

6. Diagrams are NOT necessarily drawn to scale.

7. Write neatly and legibly.

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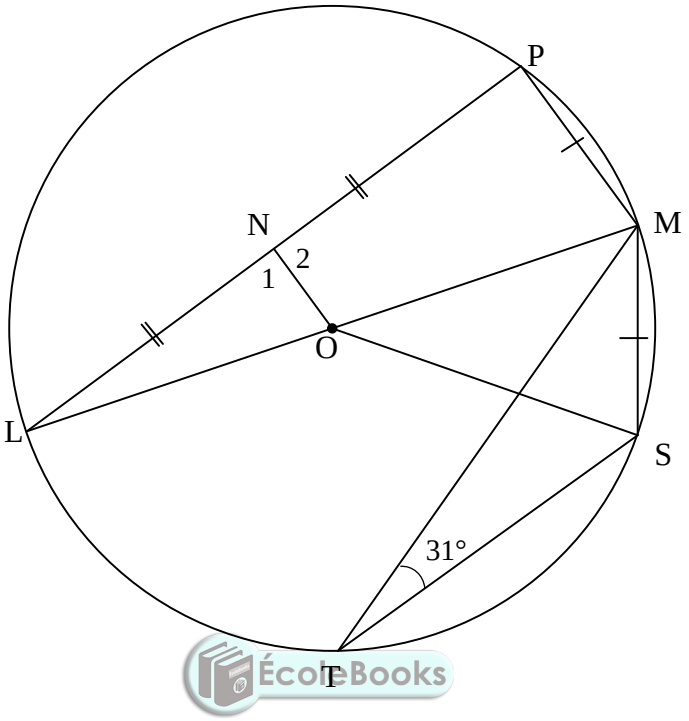
EC FET CURRICULUM: GRADE 12 MATHEMATICS TOPIC TEST 4 OF 2020

QUESTION 1

1.1 In the diagram, O is the centre of the circle and LOM is a diameter of the circle. ON bisects chord LP at N. T and S are points on the circle on the other side of LM with respect to P. Chords PM, MS, MT and ST are drawn. PM = MS and $M\hat{T}S = 31°$



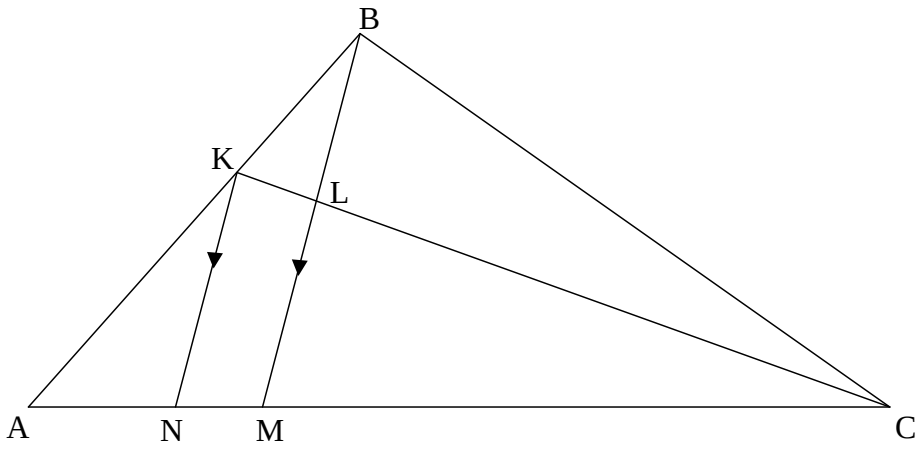
1.1.1 Determine, with reasons, the size of each of the following angles:

(a) $M\hat{O}S$ (2)

(b) $\hat{L}$ (2)

1.1.2 Prove that $ON = \frac{1}{2}MS$. (4)

1.2 In ΔABC in the diagram, K is a point on AB such that AK : KB = 3 : 2. N and M are points on AC such that KN || BM. BM intersects KC at L. AM : MC = 10 : 23.



Determine, with reasons, the ratio of:

1.2.1 $\frac{AN}{AM}$ (2)

1.2.2 $\frac{CL}{LK}$ (3)

[13]

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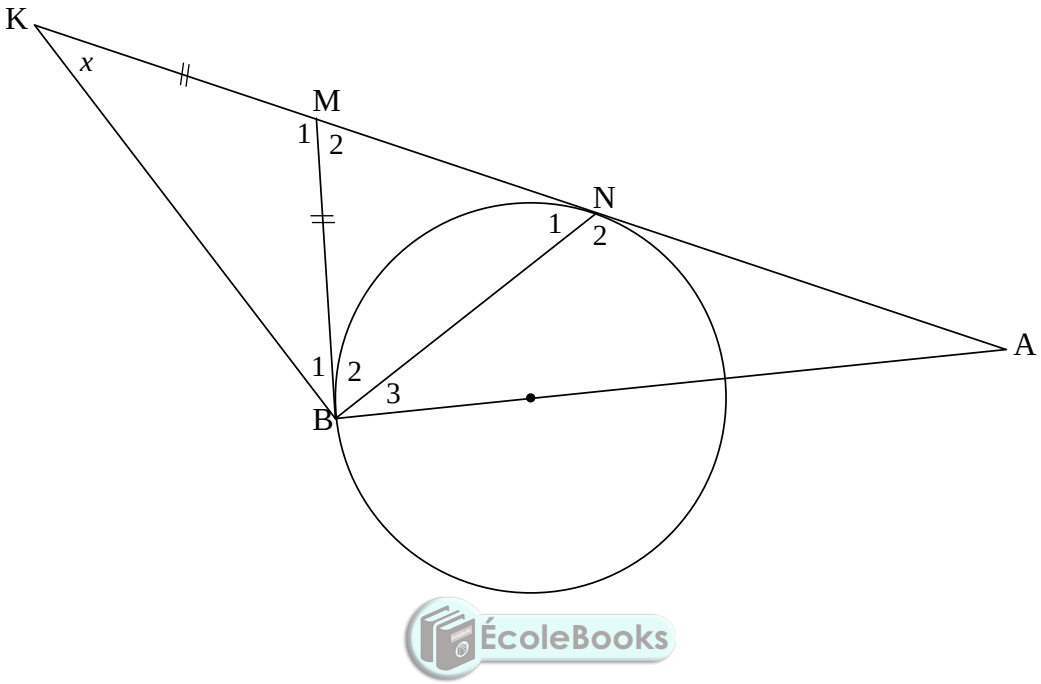
QUESTION 2

In the diagram, tangents are drawn from point M outside the circle, to touch the circle at B and N. The straight line from B passing through the centre of the circle meets MN produced in A. NM is produced to K such that BM = MK. BK and BN are drawn.

Let $\hat{K} = x$.



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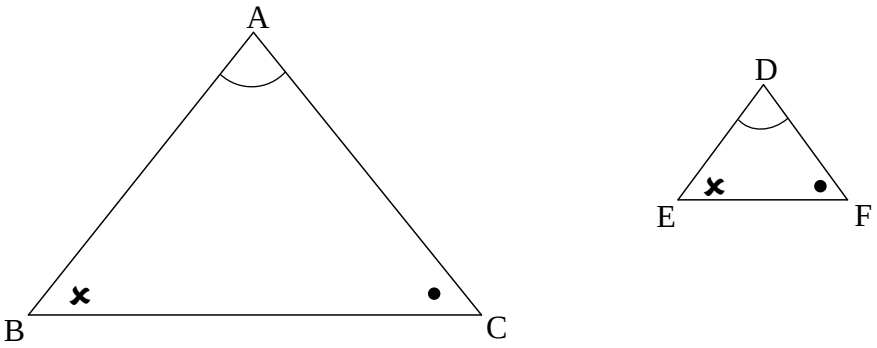
2.1 Determine, with reasons, the size of $\hat{N}_1$ in terms of x. (6)

2.2 Prove that BA is a tangent to the circle passing through K, B and N. (5)

[11]

QUESTION 3

3.1 In the diagram, ΔABC and ΔDEF are drawn such that $\hat{A} = \hat{D}$, $\hat{B} = \hat{E}$ and $\hat{C} = \hat{F}$.



Use the diagram in the ANSWER BOOK to prove the theorem which states that if two triangles are equiangular, then the corresponding sides are in proportion, that is $\frac{AB}{DE} = \frac{AC}{DF}$. (6)

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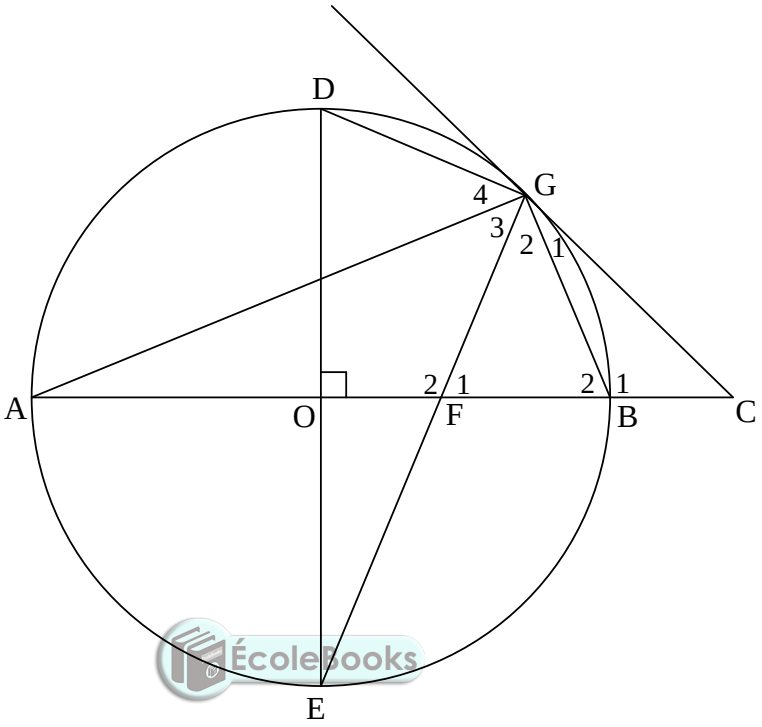
3.2 In the diagram, O is the centre of the circle and CG is a tangent to the circle at G. The straight line from C passing through O cuts the circle at A and B. Diameter DOE is perpendicular to CA. GE and CA intersect at F. Chords DG, BG and AG are drawn.



3.2.1 Prove that:

(a) DGFO is a cyclic quadrilateral (3)

(b) GC = CF (5)

3.2.2 If it is further given that CO = 11 units and DE = 14 units, calculate:

(a) The length of BC (3)

(b) The length of CG (5)

(c) The size of $\hat{E}$. (4)

[26]

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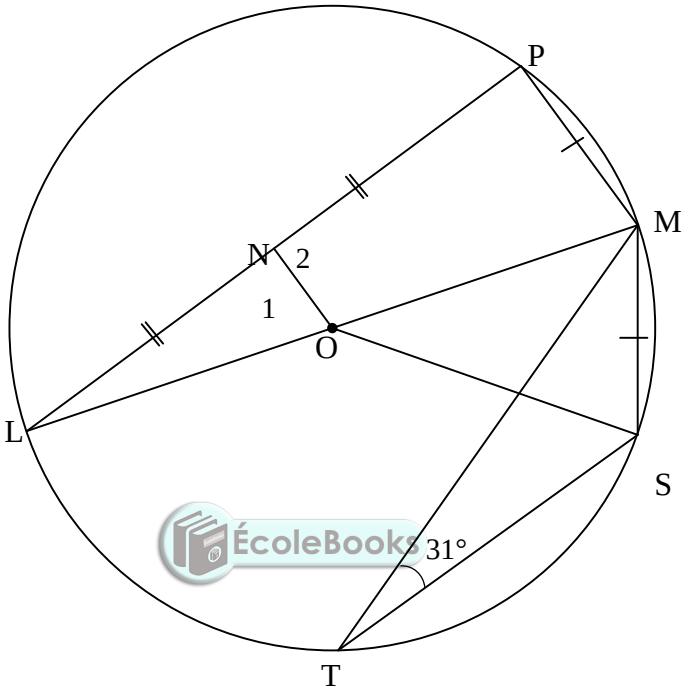
Give reasons for your statements / *Gee redes vir jou bewerings*

QUESTION/*VRAAG 1*

1.1



	Solution/*Oplossing*	**Marks** ***Punte***
1.1.1(a)		(2)
1.1.1(b)		(2)
1.1.2		(4)

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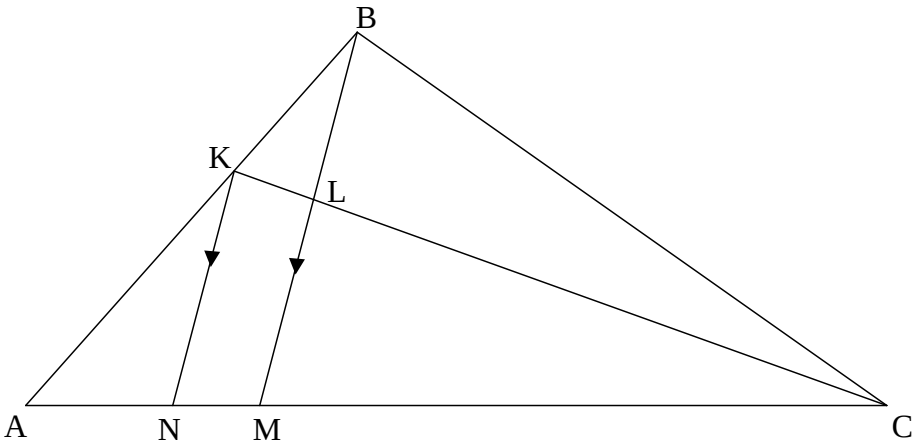
1.2



	Solution/*Oplossing*	**Marks** ***Punte***
1.2.1		(2)
1.2.2		(3)
		[13]

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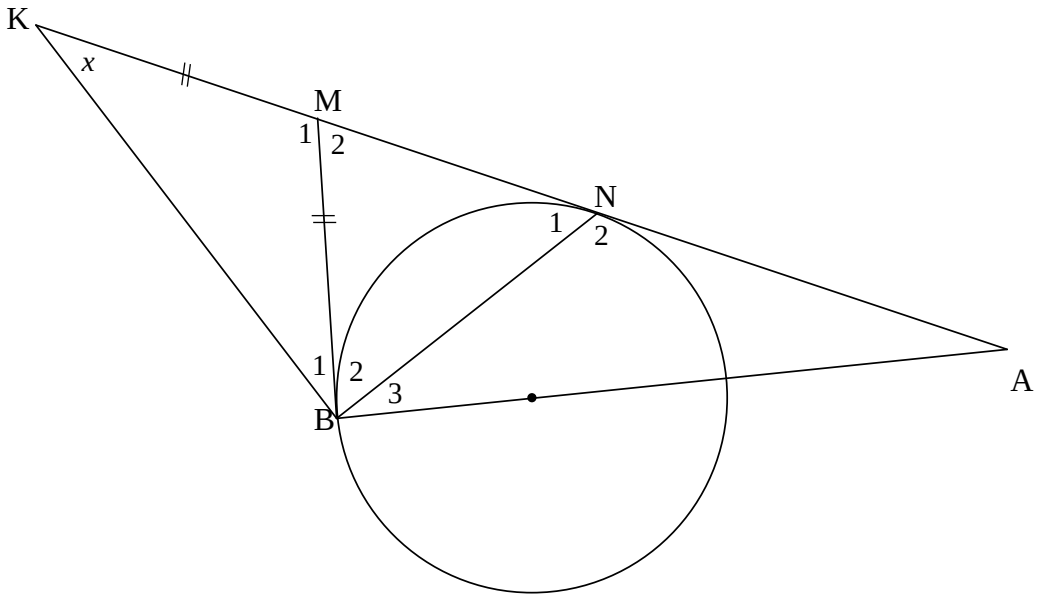
QUESTION/*VRAAG* 2



	Solution/*Oplossing*	**Marks** ***Punte***
2.1		(6)
2.2		(5)
		[11]

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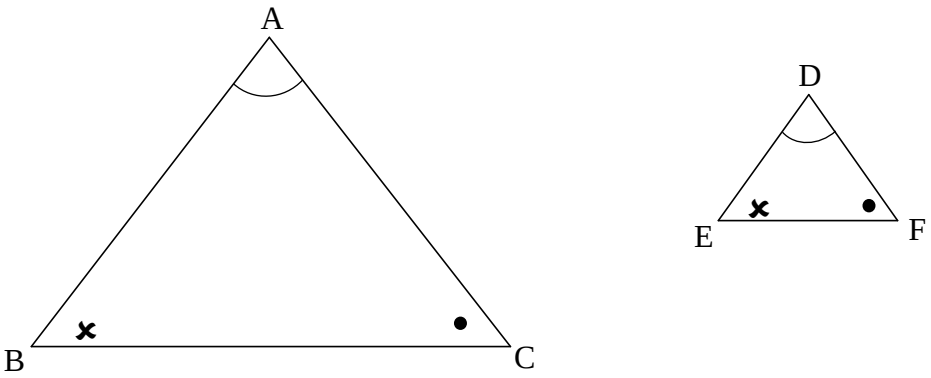
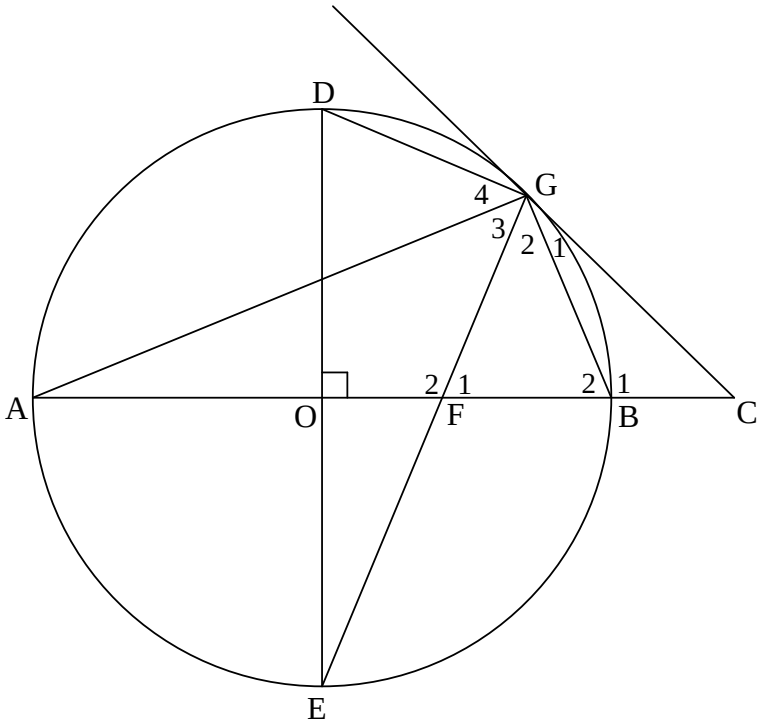
QUESTION/*VRAAG* 3

3.1



	Solution/*Oplossing*	**Marks** ***Punte***
		(6)

3.2



	Solution/*Oplossing*	**Marks** ***Punte***
3.2.1(a)		(3)
3.2.1(b)		(5)
3.2.2(a)		(3)

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	Solution/*Oplossing*	**Marks** ***Punte***
3.2.2(b)		(5)
3.2.2(c)		(4)
		[26]
	TOTAL/*TOTAAL*:	**50**

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