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TOTAL MARKS

Sequence number

NATIONAL SENIOR CERTIFICATE EXAMINATION
NOVEMBER 2026

MATHEMATICS: PAPER II

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EXAMINATION NUMBER

Time: 3 hours 150 marks

PLEASE READ THE FOLLOWING INSTRUCTIONS CAREFULLY

1. This question paper consists of 28 pages and an Information Sheet of 2 pages (i–ii). Please check that your question paper is complete.
2. Read the questions carefully.
3. **Answer ALL the questions on the question paper and hand it in at the end of the examination. Remember to write your examination number in the space provided on the question paper.**
4. Diagrams are not necessarily drawn to scale.
5. You may use an approved non-programmable and non-graphical calculator unless otherwise stated.
6. Ensure that your calculator is in **DEGREE** mode.
7. Clearly show **ALL** calculations, diagrams, graphs, etc. that you have used in determining your answers. **Answers only will NOT necessarily be awarded full marks.**
8. Round off to **TWO DECIMAL PLACES** unless otherwise stated.
9. It is in your own interest to write legibly and to present your work neatly.
10. All Euclidean geometry statements must be accompanied by a relevant reason.
11. Two blank pages (pages 27–28) and extra graphs (page 26) are included at the end of the paper. If you run out of space for a question, use these pages. Clearly indicate the number of the question that you are answering should you use this additional space.

FOR OFFICE USE ONLY: MARKER TO ENTER MARKS

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13	Q14	TOTAL
9	17	12	7	7	15	12	10	13	9	7	14	11	7	150

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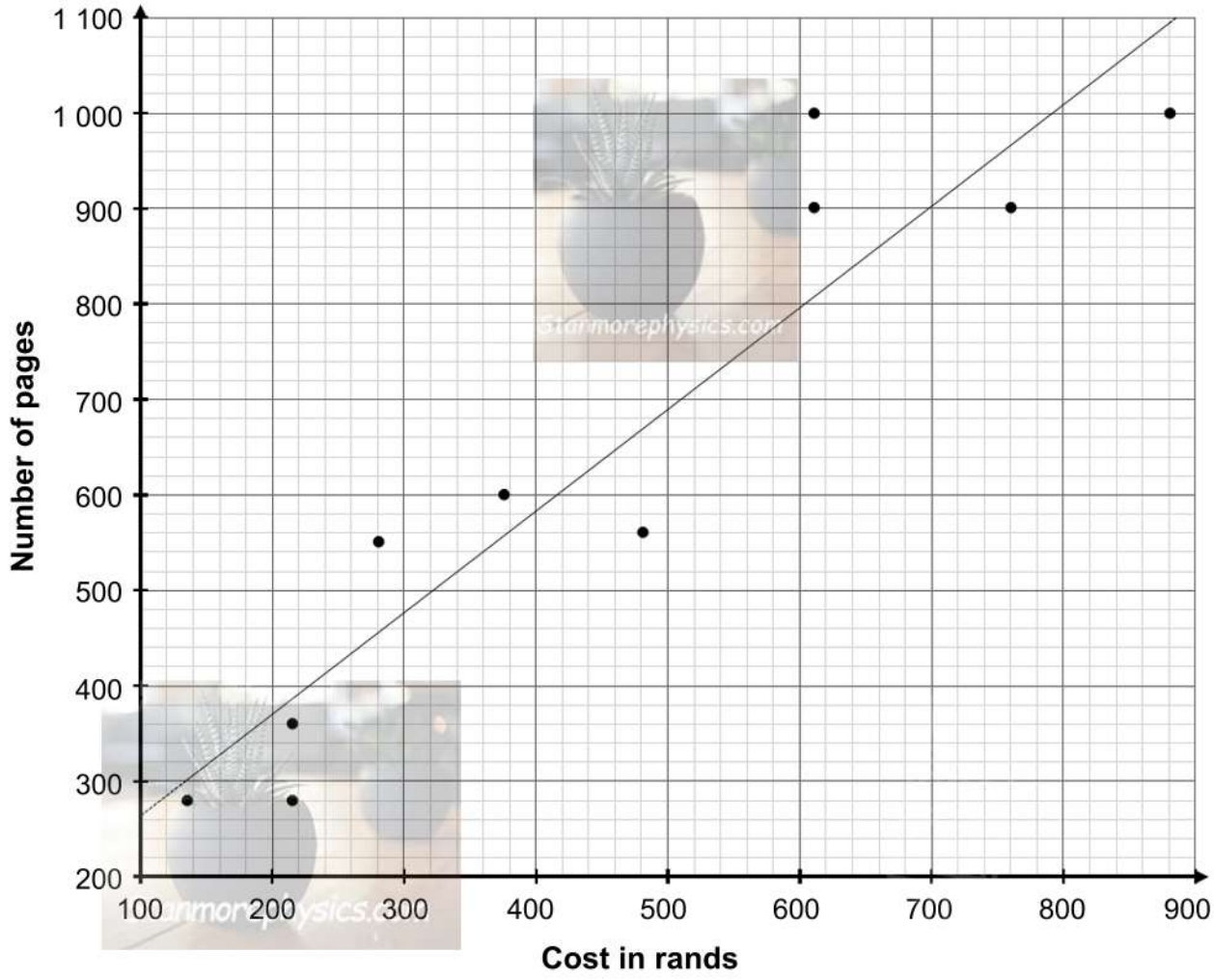
SECTION A

QUESTION 1

A customer compares 10 books in a bookstore. She compares the number of pages in a book (rounded to the nearest 5) to the cost of the book (rounded to the nearest R10).

She represents her data in a table and a scatter plot below.

Number of pages	135	215	215	280	375	480	610	610	760	880
Cost in rands	280	280	360	550	600	560	900	1 000	900	1 000



(a) In the scatter plot above, the line of best fit has been drawn. Show on the graph where you would read off the number of pages that you would expect there to be in a book that costs R700.

(1)

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(b) Determine the equation of the least squares regression line (line of best fit) of the data in the form $\hat{y} = a + bx$.

(2)

(c) (1) If the customer has R2 000 to buy one book, use the equation of the line of best fit in (b) to determine how many pages that she could expect this book to contain.

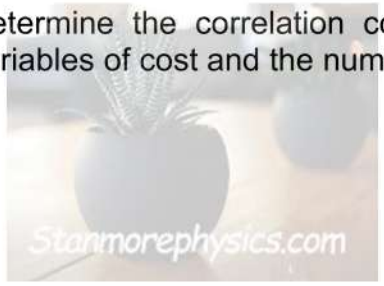
(2)

(2) Is your answer in (c)(1) reliable? Explain.



(2)

(d) Determine the correlation coefficient and describe the correlation between the variables of cost and the number of pages.



(2)
[9]

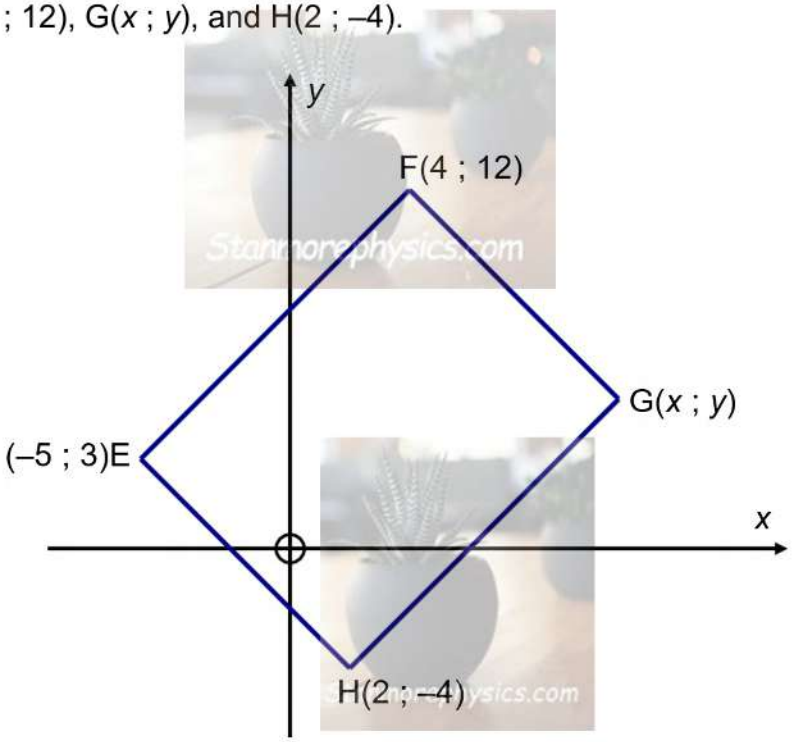
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QUESTION 2

Given:

- Parallelogram EFGH.
- E(–5 ; 3), F(4 ; 12), G(x ; y), and H(2 ; –4).



(a) Determine the equation of line EF.

(3)

(b) Determine the angle of inclination of EH.

(3)

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(c) Prove that EFGH is a rectangle. An appropriate reason must be given.

(3)

(d) Find the length of FH in simplest surd form.

(2)

(e) Find M, the midpoint of FH.

(2)

(f) Determine the coordinates of G.

(2)

(g) E, F, G, and H all lie on the circumference of a circle. Determine the equation of this circle.

(2)
[17]

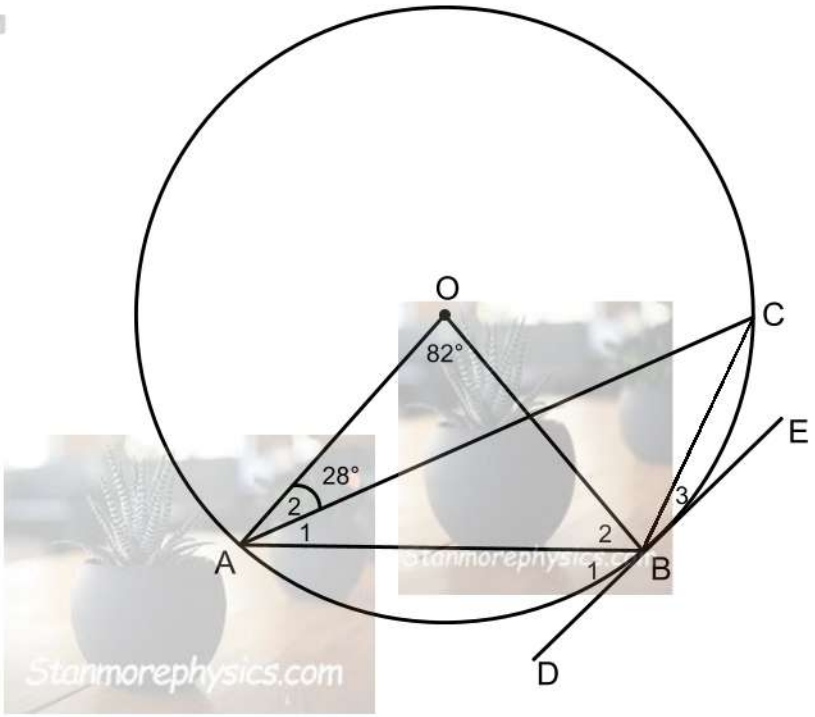
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QUESTION 3

(a) In the diagram:

- O is the centre of the circle;
- A, B, and C lie on the circumference of the circle to form ΔABC;
- DE is a tangent to the circle at B; and
- $\hat{A}_2 = 28°$ and $\hat{O} = 82°$.



Complete the appropriate statement for the supplied reasons by giving the numerical values of the angles.

Statement	Reason
$\hat{C} =$ ____	Angle at centre
$\hat{B}_1 =$ ____	Tan chord theorem
$\hat{B}_2 =$ ____	Tan $\perp$ radius
AO = ____	Radii
$\hat{A}_1 =$ ____	Interior angles of an isosceles triangle
$\hat{B}_3 =$ ____	Tan chord theorem

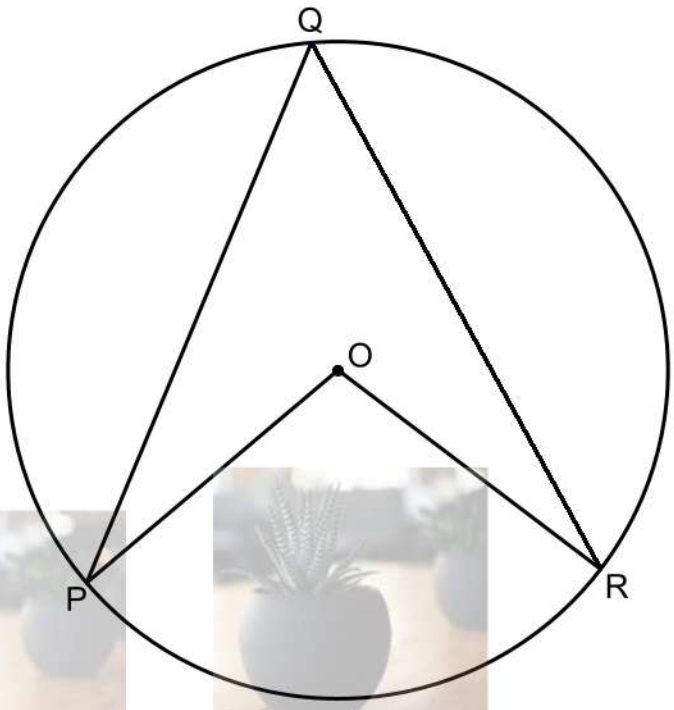
(6)

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(b) Use the diagram below to prove the theorem that states:

'The angle subtended by an arc at the centre of the circle is twice the size of the angle that it subtends at the circumference.'



Required to prove: $P\hat{O}R = 2 \times P\hat{Q}R$

Construction: _____ (1)

Proof:

(5)
[12]

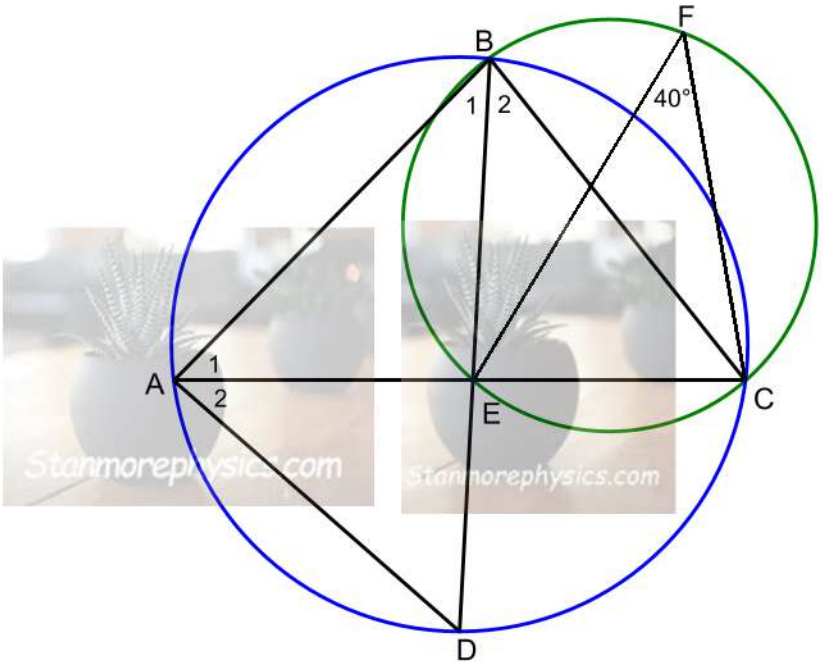
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QUESTION 4

In the diagram:

- two circles intersect at B and C;
- A and D lie on the larger circle;
- AC and BD intersect at E;
- E and F lie on the smaller circle;
- $\hat{F} = 40°$; and
- DB bisects angle $A\hat{B}C$.



(a) Determine three angles equal to $40°$.

(5)

(b) Prove that AD is a tangent to the circle through points A, E, and B.

(2)
[7]

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QUESTION 5

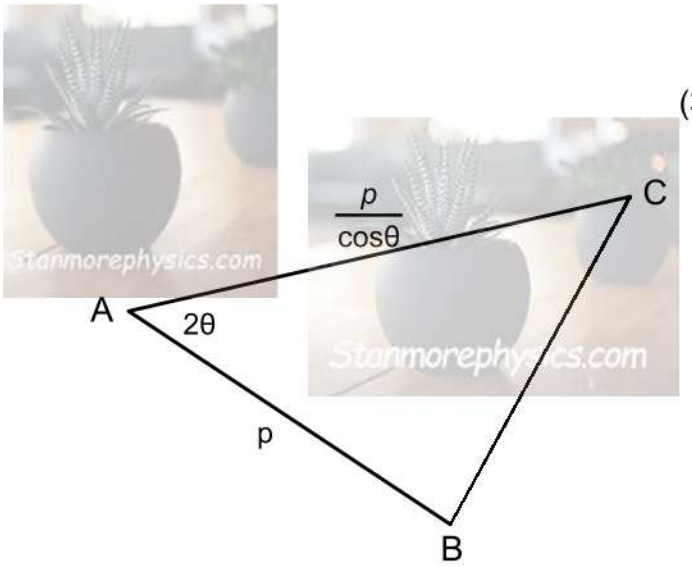
(a) Determine the general solution:

$$3\tan(x-50°)-9=0$$

(3)

(b) Given ΔABC with:

- $\hat{A}=2\theta$; and
- $AB=p$ and $AC=\frac{p}{\cos\theta}$.



Determine the area of ΔABC in terms of p and θ. Write your answer in the simplest form.

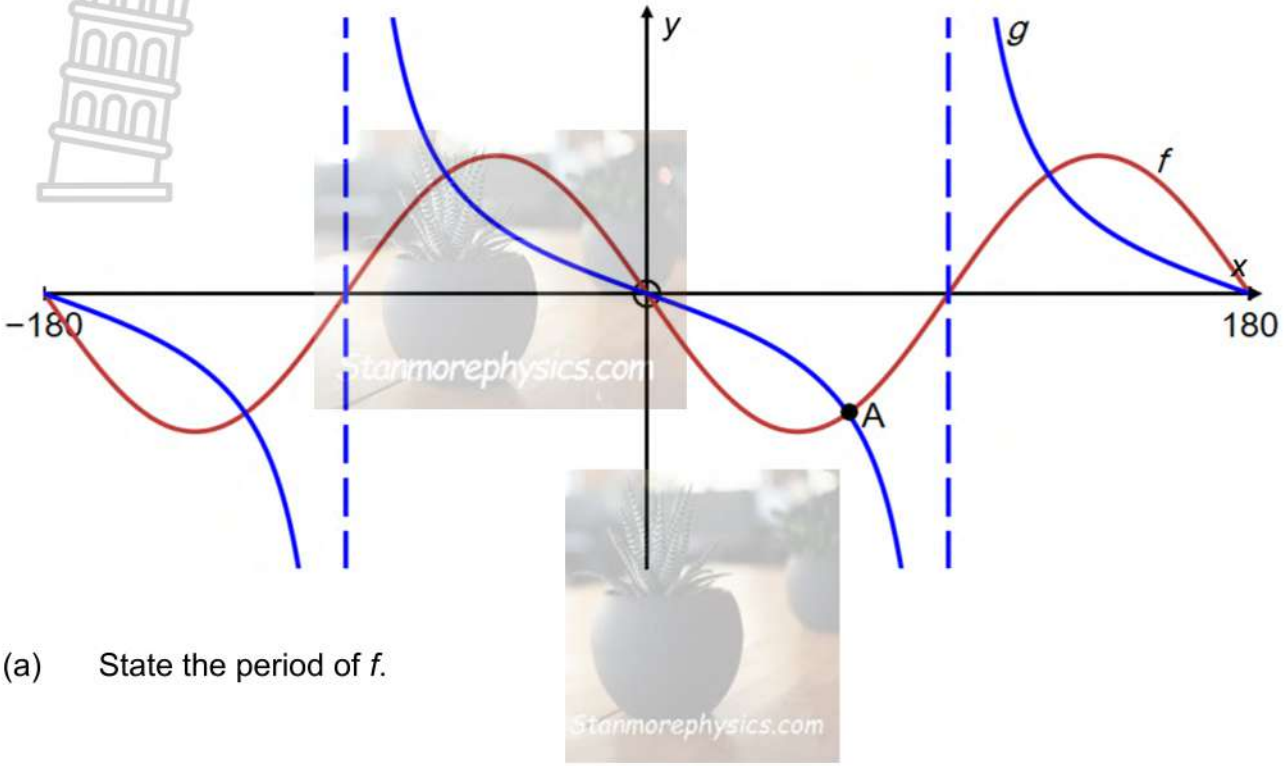
(4)
[7]

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QUESTION 6

Sketched is $f(x) = -2\sin 2x$ and $g(x) = -\tan x$, where $x \in [-180°; 180°]$.



(a) State the period of f.

(1)

(b) Determine the range of f.

(2)

(c) Write down the equations of the asymptotes of g.

(2)

(d) For which values of x is $f(x) > 0$?

(2)

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(e) Determine the coordinates of A. All working must be shown.





(8)
[15]

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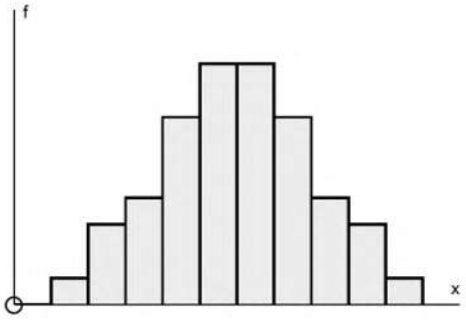
QUESTION 7

(a) Study the histograms and cumulative frequency curves (ogives).

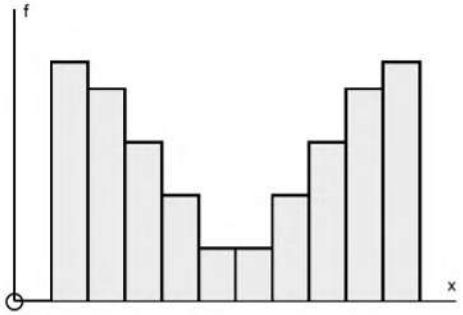
A



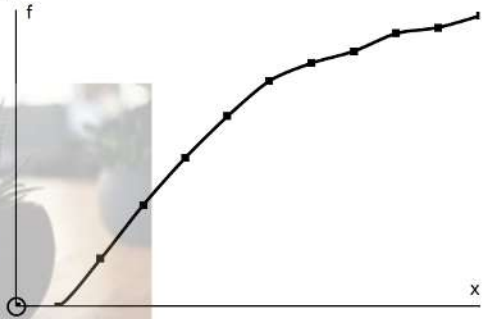
B



C



D

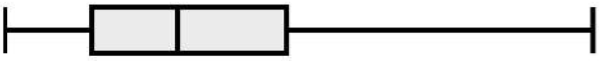


Match the histogram or the cumulative frequency curve to the corresponding box and whisker plot below.

Write the letter of the histogram or the cumulative frequency curve on the line next to its matching box and whisker plot.

(1) 

_____

(2) 

_____

(4)

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(b) Five numbers are given in ascending order:

$$11; a; b; c; d$$

The numbers have the following properties:

- Maximum – minimum = 9
- Mode $= Q_2 = 17$
- $\bar{x} = 16$

Determine the values of a, b, c, and d.



(4)

(c) The following information is given:

- $\frac{\sum(x-\bar{x})^2}{n} = \frac{\sum(x-14)^2}{32} = 51{,}84$
- Two of the values in the data set are 8 and 23.

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Determine whether the two data values lie within one standard deviation from the mean.

(4)
[12]

79 marks

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SECTION B

QUESTION 8

(a) Prove:

$$\tan(x-45^\circ)=\frac{\sin x-\cos x}{\cos x+\sin x}$$

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(5)

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(b) Hence, sketch the graph of $y = \dfrac{\sin(x+90°) - \cos(x+90°)}{\cos(x+90°) + \sin(x+90°)}$ if $x \in [-45°; 315°]$.
Show all asymptotes and cuts with the axes.



(5)
[10]

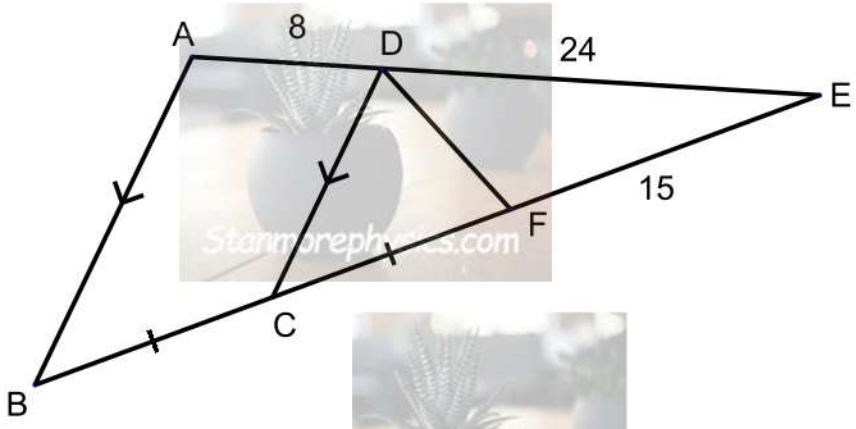
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QUESTION 9

(a) Given ΔABE and:

- D lies on AE and C lies on BE such that AB||DC;
- F lies on BE such that $BC = CF$; and
- AD is 8 cm, DE is 24 cm, and FE is 15 cm.



Determine the length of BF.

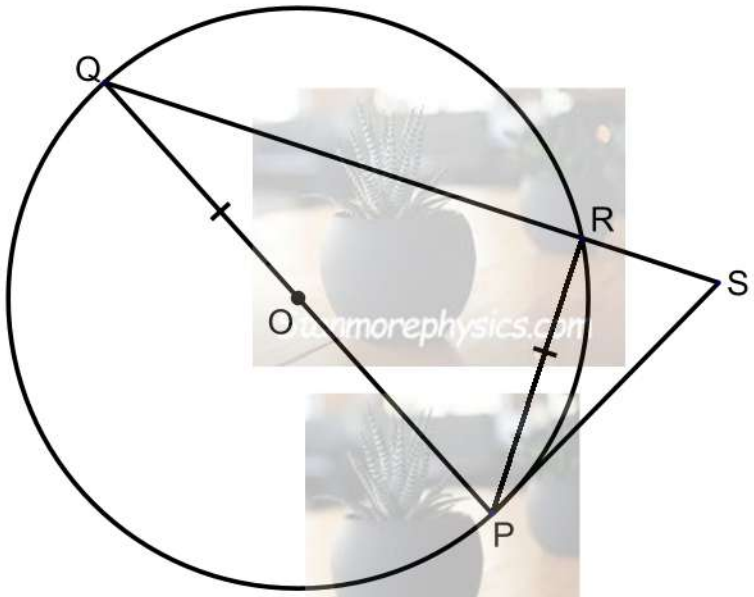
(5)

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(b) Given:

- Circle with centre O and diameter QP.
- R lies on the circle, and QR extended meets the tangent from P at S.
- OQ = PR.



Determine the size of $\hat{S}$.

(8)
[13]

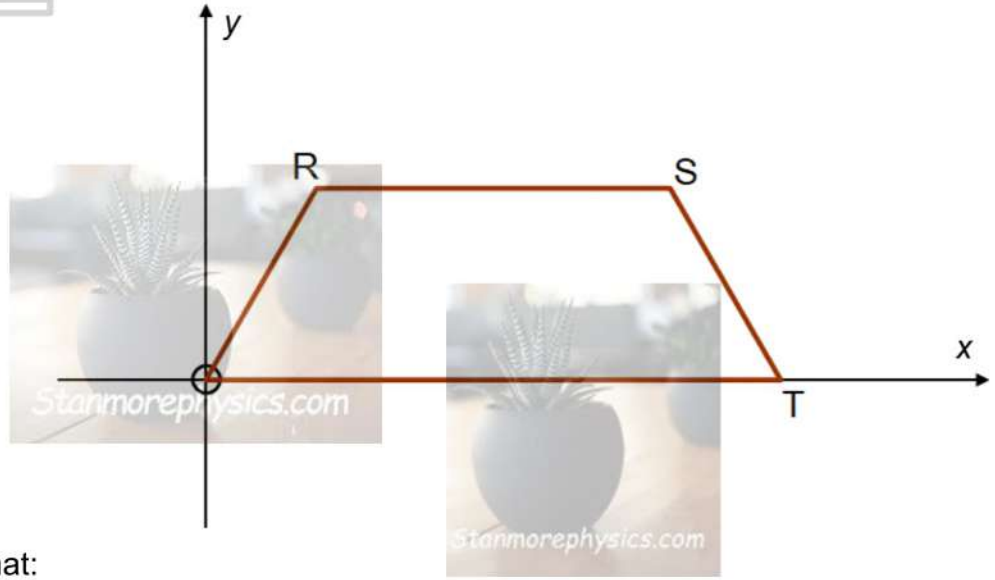
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QUESTION 10

O is the origin in the diagram with:

- Quadrilateral ORST;
- OR has the equation $y = \sqrt{3}x$;
- RS has a gradient of 0; and
- ST has the equation $y = -\sqrt{3}x + 9\sqrt{3}$.



Prove that:

(a) RS || OT.

(2)

(b) ORST is a cyclic quadrilateral.

(7)
[9]

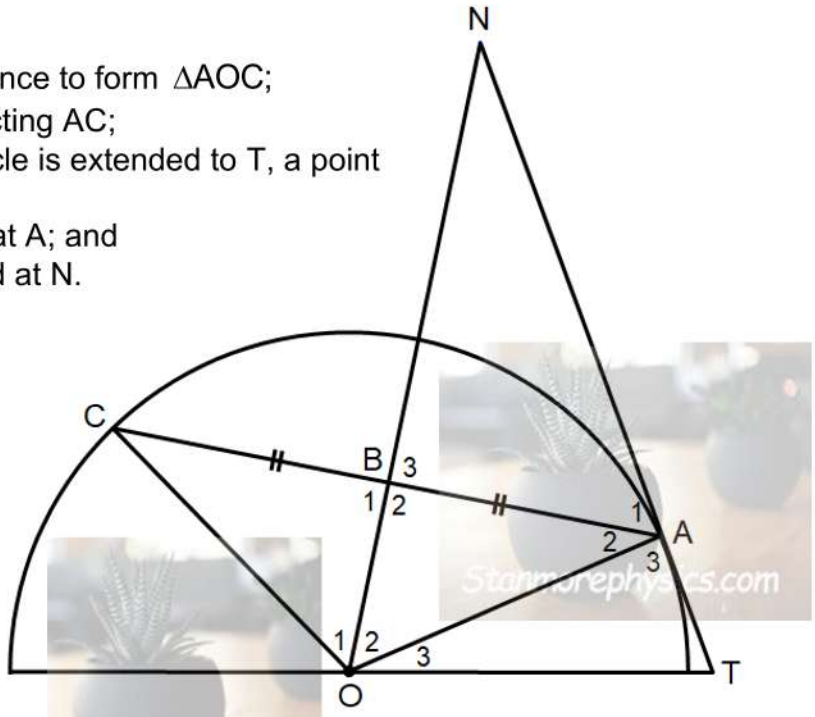
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QUESTION 11

Given half circle with centre O and:

- points A and C on the circumference to form ΔAOC;
- B is a point on AC, with OB bisecting AC;
- the given diameter of the half circle is extended to T, a point outside of the circle;
- TA is a tangent to the half circle at A; and
- OB extended meets TA extended at N.



Show that $BC^2 = BN \times BO$.

[7]

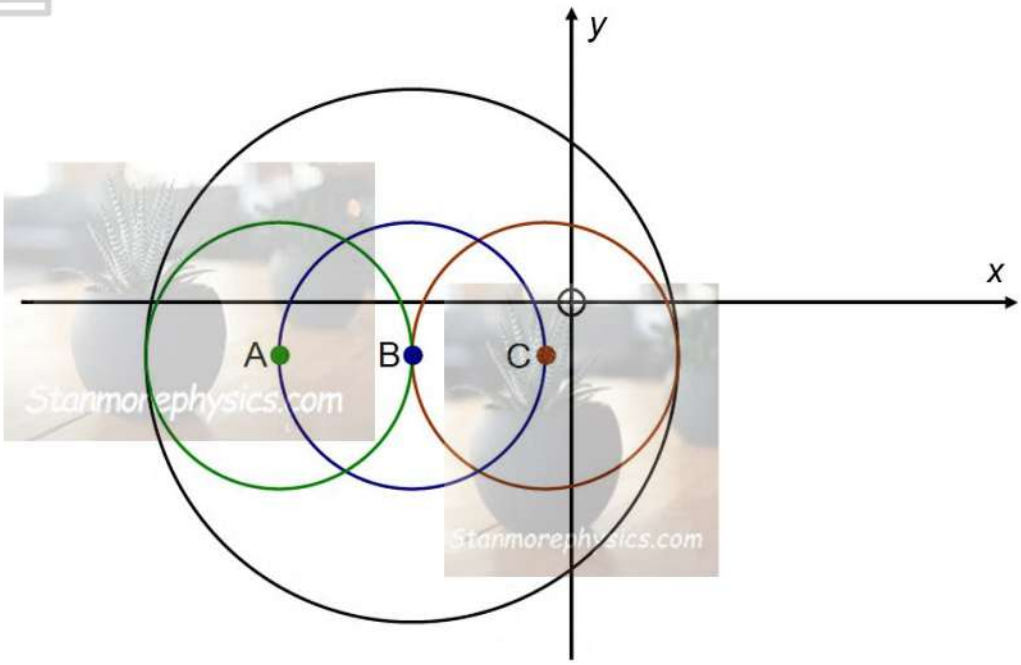
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QUESTION 12

In the diagram:

- the circles with centres A, B, and C are all congruent;
- the larger circle also has the centre B and is tangent to circle A and circle C;
- A, B, and C are all co-linear; and
- the circle with **centre A** is defined by the equation $x^2 + 11x + y^2 + 2y + 25 = 0$.

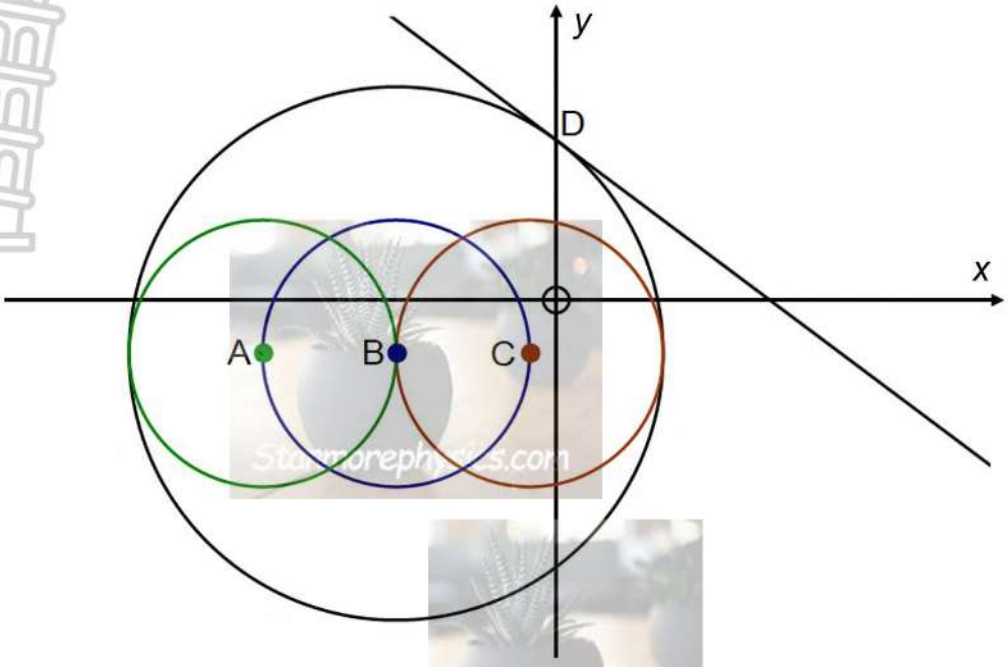


(a) Determine the shortest distance between the smaller circle B and the *y*-axis. (7)

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(b) A tangent is drawn to the larger circle with centre B at D. D is one of the *y*-intercepts of the larger circle.



Determine the equation of the tangent to the larger circle at D.

(7)
[14]

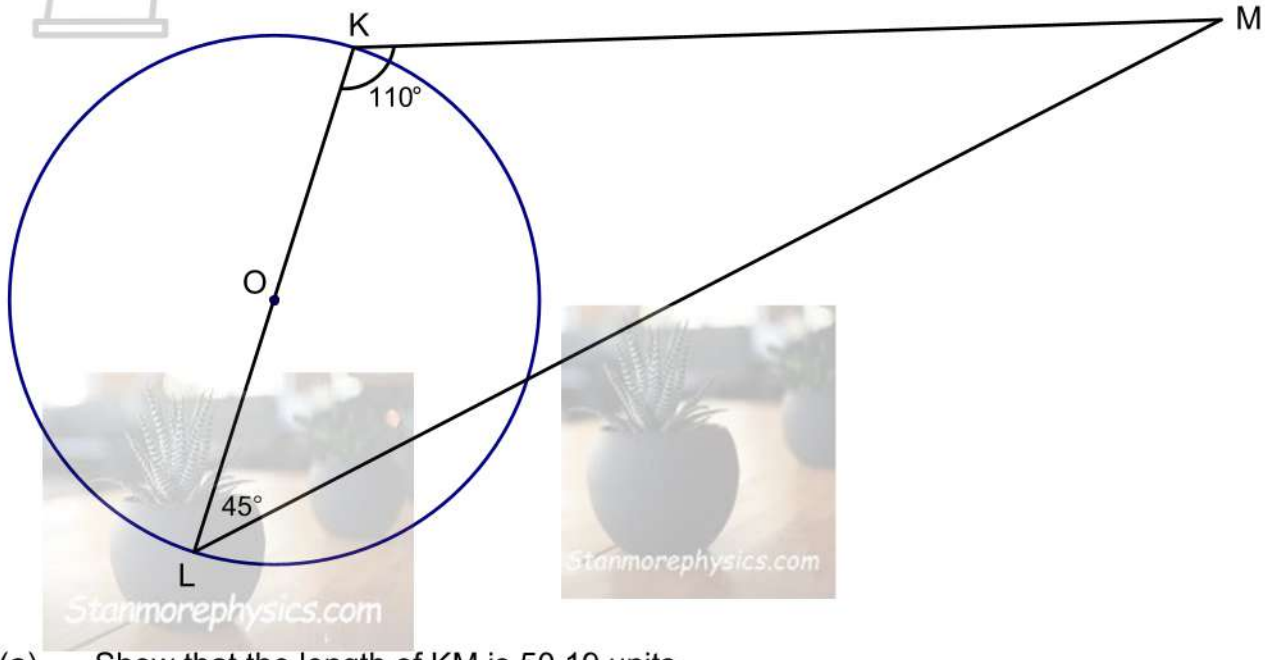
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QUESTION 13

Given:

- Circle with centre O, a circumference of 30π units, and diameter KL.
- ΔKLM with M, a point outside of the circle.
- $\hat{K} = 110°$ and $\hat{L} = 45°$.



(a) Show that the length of KM is 50,19 units.

(4)

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(b) An altitude is dropped from point K down to line LM at N.

An altitude is defined as a line segment that extends from a vertex of a figure to the opposite side (base), intersecting it at a right angle.

M is then raised into the vertical plane so that M is directly above N.

Determine the angle of elevation from O to M.



(7)
[11]

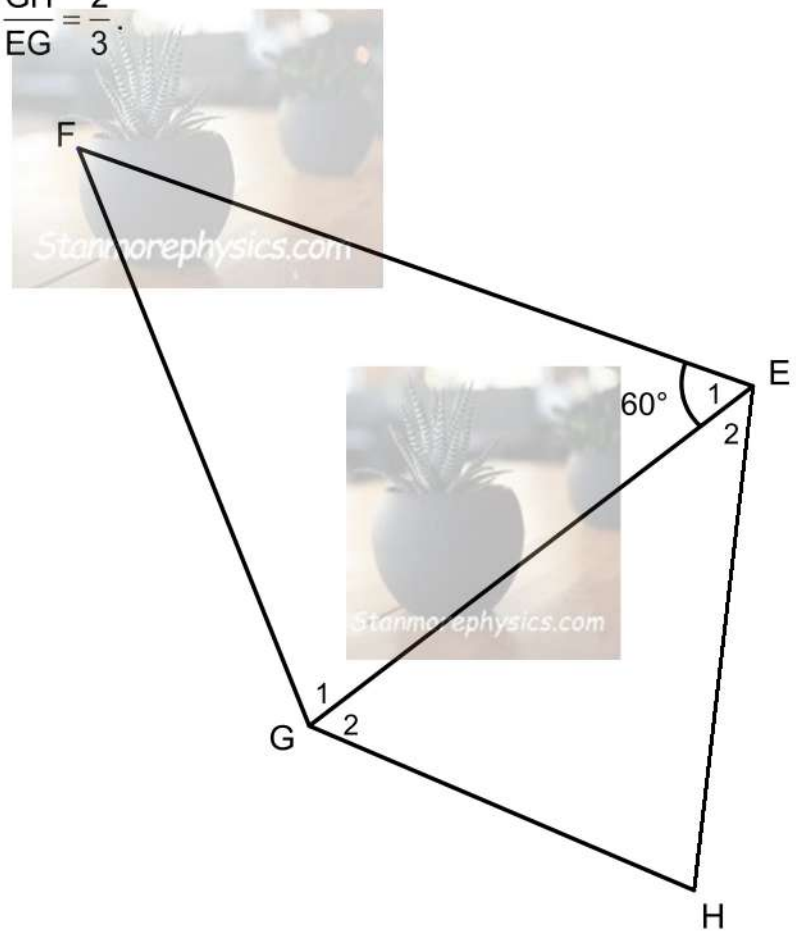
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QUESTION 14

Given:

- Quadrilateral EFGH, with the diagonal EG that forms ΔEGH and ΔEGF.
- $\hat{E}_1 = 60°$.
- $\frac{GE}{EF} = \frac{EH}{FG} = \frac{GH}{EG} = \frac{2}{3}$.



Determine the size of $\hat{H}$.

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[7]

71 marks

Total: 150 marks

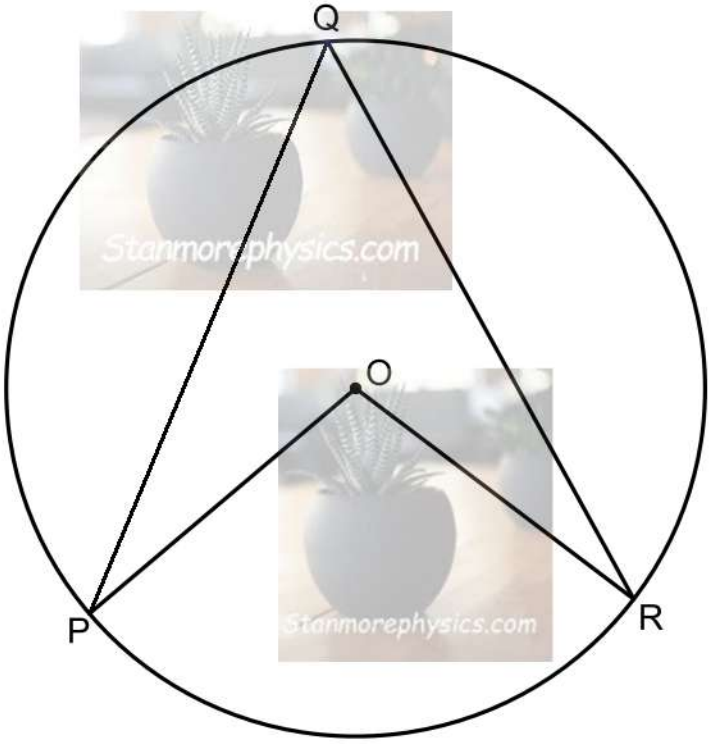
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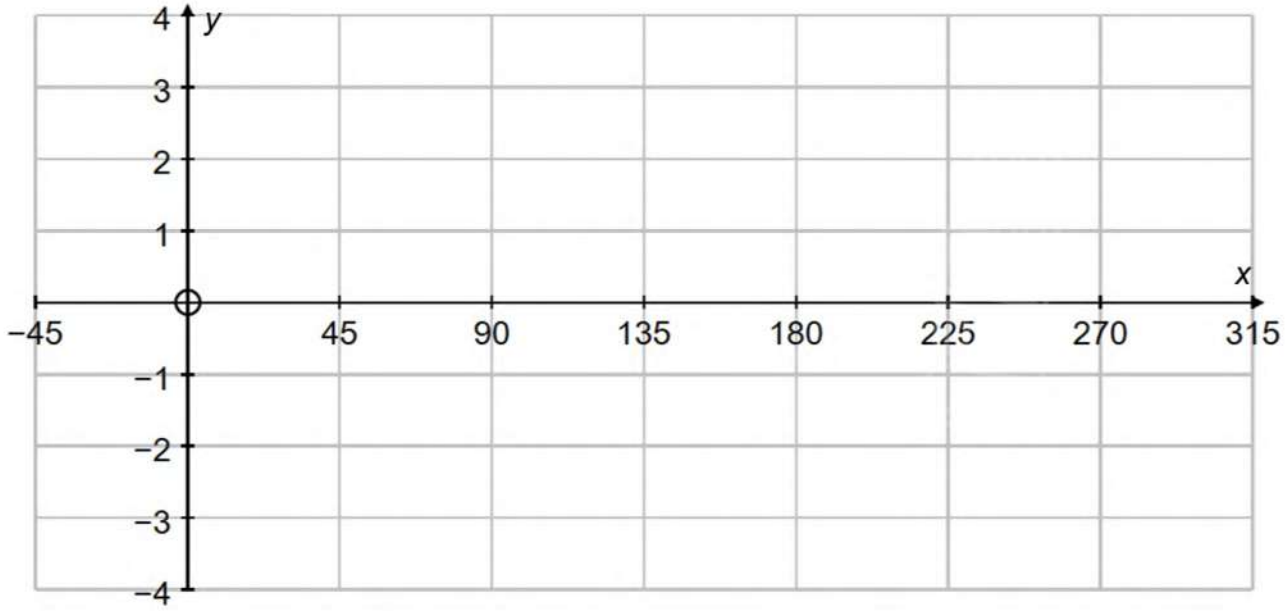
ADDITIONAL SPACE (EXTRA GRAPHS)

EXTRA GRAPHS ARE ONLY TO BE USED IF AN ERROR WAS MADE ON THE ORIGINAL GRAPH.

QUESTION 3 (b)



QUESTION 8 (b)



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ADDITIONAL SPACE (ALL QUESTIONS)

REMEMBER TO CLEARLY INDICATE AT THE QUESTION THAT YOU USED THE ADDITIONAL SPACE TO ENSURE THAT ALL ANSWERS ARE MARKED.





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