

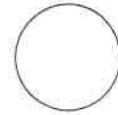


basic education
 Department:
 Basic Education
 REPUBLIC OF SOUTH AFRICA

Candidate Barcode Label/Stafieskodeplakker

SC/NSC Answer Book
 SS/NSS-Antwoordeboek

SENIOR CERTIFICATE EXAMINATIONS/NATIONAL SENIOR CERTIFICATE EXAMINATIONS
 SENIOR SERTIFIKAAT-EKSAMEN/NASIONALE SENIORSERTIFIKAAT-EKSAMEN (Grade 12/Graad 12)



Sequence No. on mark sheet
 Volgnommer op puntestaaf

CENTRE NUMBER
 SENTRUMNUMMER

EXAMINATION NUMBER
 EKSAMENNUMMER

DATE
 DATUM

BOOK NUMBER
 BOEKNOMMER

OF
 VAN

BOOKS
 BOEKE

SUBJECT CODE
 VAKKODE

PAPER NUMBER
 VRAESTELNUMMER

2

SUBJECT NAME
 VAKNAAM

TECHNICAL MATHEMATICS/TEGNIESE WISKUNDE

This answer book consists of 23 pages./Hierdie antwoordeboek bestaan uit 23 bladsye.

MARKER/NASIENER			MODERATOR'S INITIALS IN RELEVANT BLOCK/ MODERATORPARAAF IN BETROKKE BLOKKIE					
Question Vraag	Marks Punte	Marker's Code & Initials	Marks Punte	SM	DCM	CM	IM	EM
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

RE-MARK/RE-CHECK/ HERNASIEN/HERKONTROLEER		
Question Vraag	Marks Punte	Initials Paraaf
1		
2		
3		
4		
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16		

TOTAL
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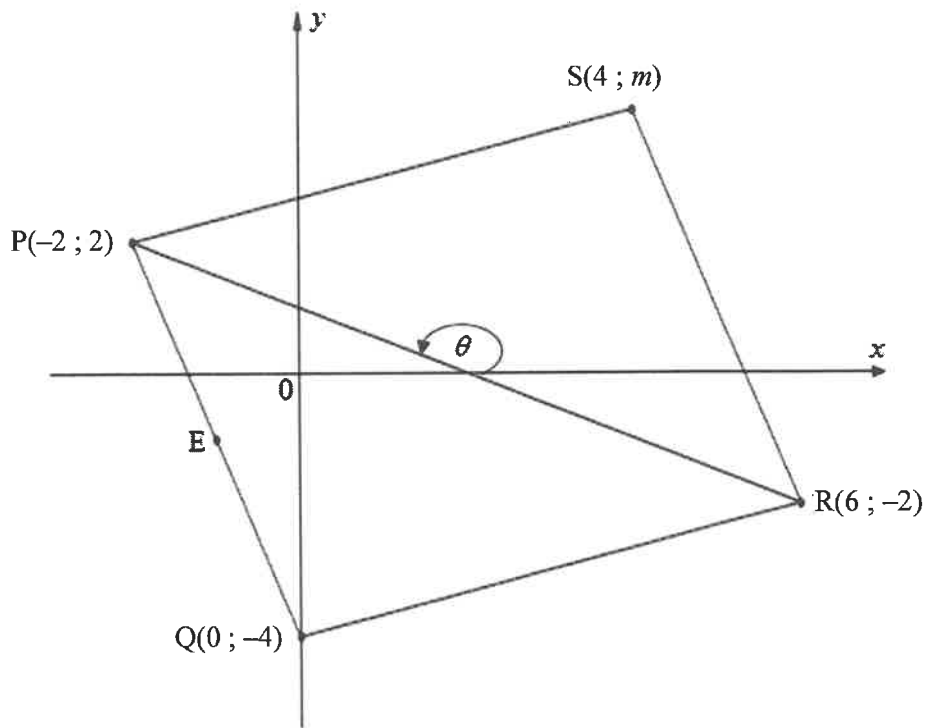
HASH TOTAL
 KAFTOTAAL

CONTROLLED AND CERTIFIED CORRECT
 SURNAME AND INITIALS OF EA

PLEASE READ INSTRUCTIONS ON THE NEXT PAGE
 LEES ASSEBLIEF INSTRUKSIES OP VOLGENDE BLADSY

PLEASE FOLLOW THESE INSTRUCTIONS CAREFULLY	VOLG ASSEBLIEF HIERDIE INSTRUKSIES NOUKEURIG
<p>1. Your examination number and centre number must be clearly written in the space provided and attach your examination number sticker in the space provided.</p> <p>2. Remember that your own name (or the name of your school) may not appear anywhere on or in this answer book.</p> <p>3. Answer ALL questions in the spaces provided.</p> <p>4. No pages may be torn from this answer book.</p> <p>5. Read the instructions printed on your timetable carefully as well as any other instructions which may be given in each examination paper.</p> <p>6. Candidates may not retain an answer book or remove it from the examination room. Answer books must be returned to the Invigilator at the end of the examination session.</p> <p>7. Answers must be written in black/blue ink as distinctly as possible. Do NOT write in the margins.</p> <p>8. Indicate the questions you have answered by drawing a circle around the relevant numbers on the front cover of the answer book where marks are to be recorded.</p> <p>9. Draw a line through any work/rough work that must not be marked.</p> <p>10. In the event that you use the additional space provided: 10.1 Write down the question number question 10.2 Leave a line and rule off after your answer.</p>	<p>1. Skryf jou eksamennommer en sentrumnummer duidelik in die ruimtes verskaf en plak jou eksamennommeretiket in die ruimte verskaf.</p> <p>2. Onthou dat jou eie naam (of die naam van jou skool) nie op of in hierdie antwoordeboek mag voorkom nie.</p> <p>3. Beantwoord ALLE vrae in die ruimtes wat verskaf is.</p> <p>4. Geen bladsye mag uit hierdie antwoordeboek geskeur word nie.</p> <p>5. Lees die instruksies wat op jou eksamenrooster gedruk is sorgvuldig deur, asook enige ander instruksies wat in elke eksamenvraestel gegee word.</p> <p>6. Geen antwoordeboek mag deur die kandidaat behou of uit die eksamenlokaal verwyder word nie. Antwoordeboeke moet aan die einde van die eksamensessie aan die toesighouer terugbesorg word.</p> <p>7. Skryf die antwoorde so duidelik moontlik met swart/blou ink. MOENIE in die kantlyn skryf NIE.</p> <p>8. Dui die vrae wat jy beantwoord het op die voorblad van die antwoordeboek aan, waar die punte aangebring word, deur 'n kringetjie om die nommers van die vrae wat jy beantwoord het, te trek.</p> <p>9. Trek 'n netjiese lyn deur enige werk/rofwerk wat nie nagesien moet word nie.</p> <p>10. In geval jy die bykomende ruimte wat verskaf is, gebruik: 10.1 Skryf die vraagnommer neer 10.2 Laat 'n lyn oop en trek 'n lyn na jou antwoord.</p>

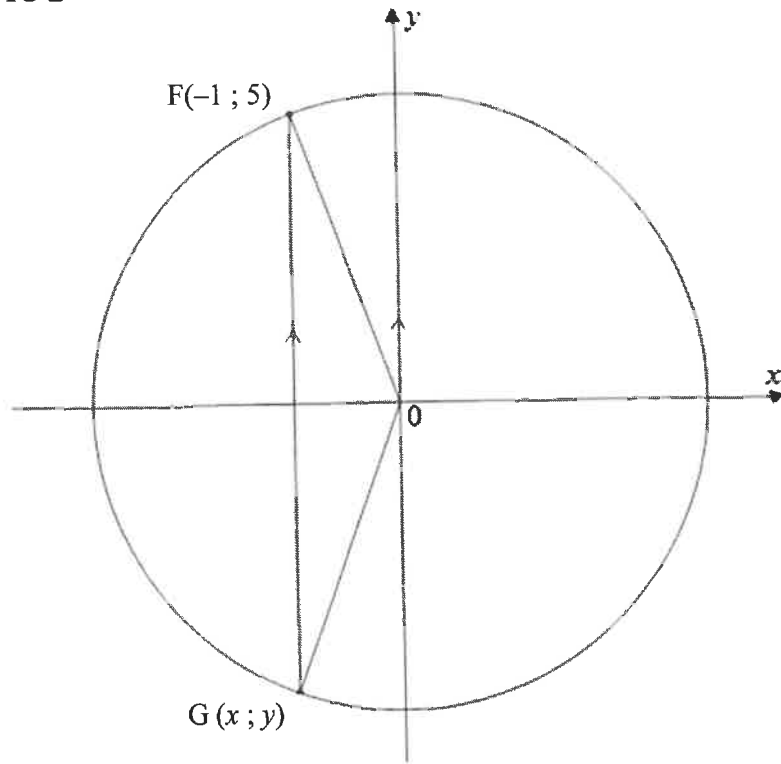
QUESTION/VRAAG 1



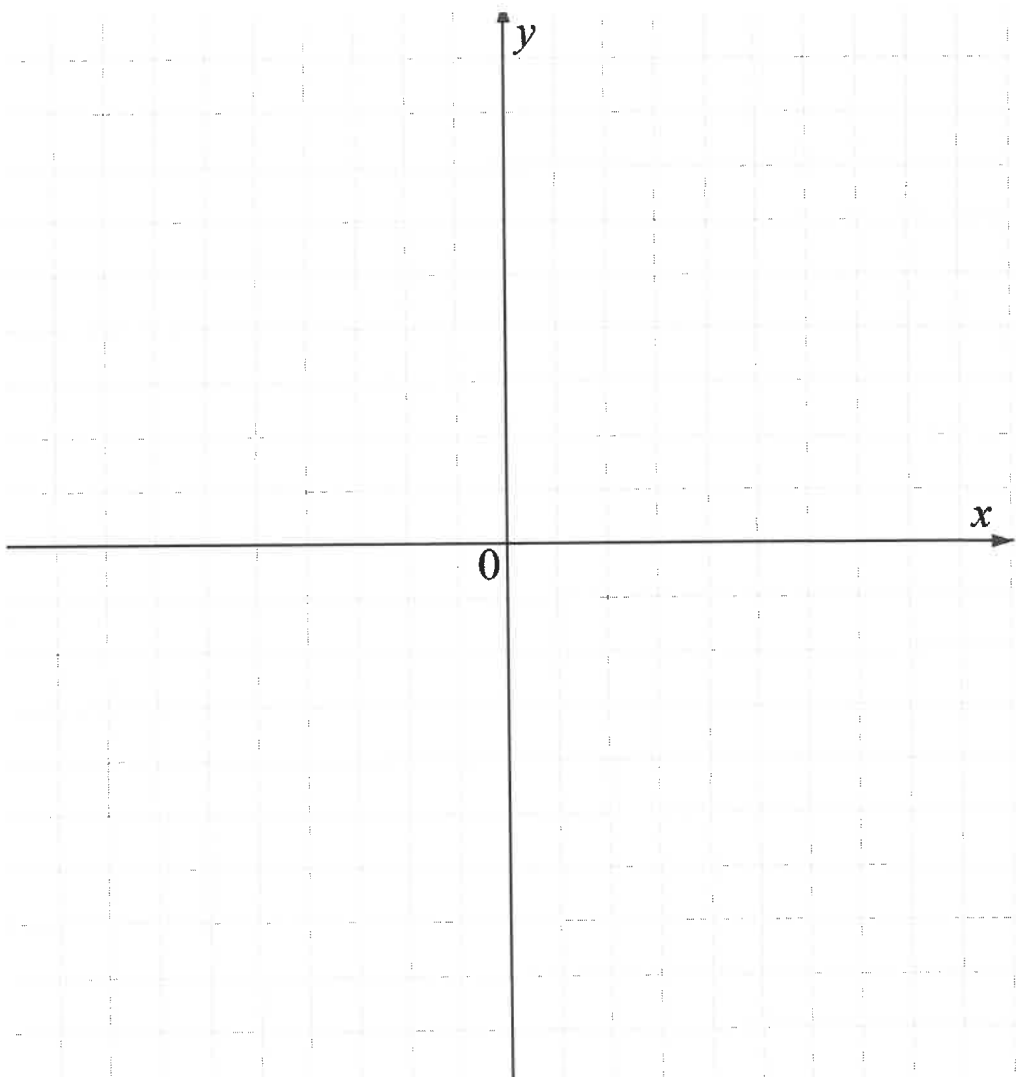
	Solution/Oplissing	Marks Punte
1.1.1		(2)
1.1.2		(3)
1.1.3		(2)

	Solution/Oplissing	Marks Punte
1.1.4		(2)
1.1.5		(4)
1.1.6		(2)
1.2		(2)
		[17]

QUESTION/VRAAG 2



	Solution/Oplissing	Marks Punte
2.1.1		(2)
2.1.2(a)		(1)
2.1.2(b)		(3)

	Solution/Oplissing	Marks Punte
2.2	 <p>A coordinate plane with a grid. The horizontal axis is labeled x and the vertical axis is labeled y. The origin is labeled 0. The grid consists of 10 units in both directions from the origin.</p>	
		(3) [9]

QUESTION/VRAAG 3

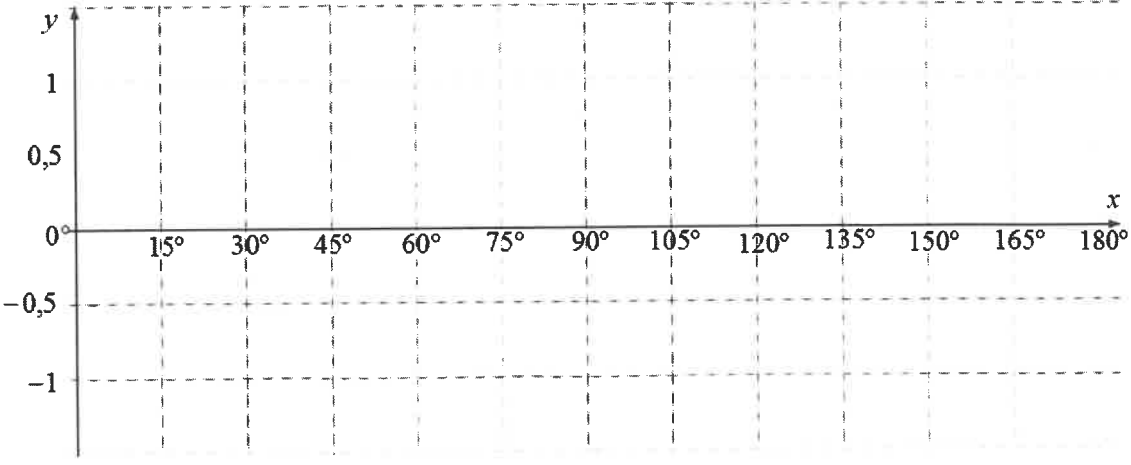
	Solution/Oplissing	Marks Punte
3.1.1		(3)
3.1.2		(3)
3.2		(7)

3.3		
		[18]

QUESTION/VRAAG 4

	Solution/Oplissing	Marks Punte
4.1		(4)
4.2		(9)
		[13]

QUESTION/VRAAG 5

	Solution/Oplissing	Marks Punte
5.1		(1)
5.2		
		[7]

QUESTION/VRAAG 6

Solution/Oplissing	Marks Punte
<p>The diagram shows a hot air balloon at point S. It is suspended by ropes from two points P and Q on the ground. A vertical line SR represents the height h. The distance between P and Q is 481,1 m. The angle at Q between the ground and the rope SQ is $33,9^\circ$. The angle at Q between the rope SQ and the vertical line SR is $23,5^\circ$. The triangle PRQ is isosceles with $PR = RQ$.</p>	
6.1	(2)
6.2	(3)

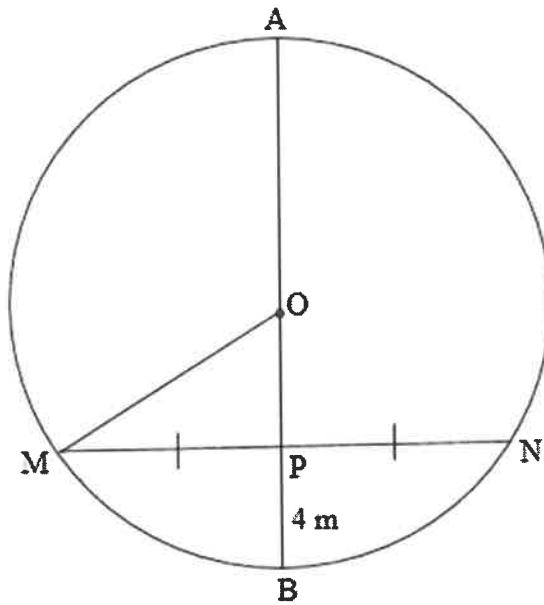
6.3		
	(3)	
6.4		
	(2)	
	[10]	

Give reasons for your statements in QUESTIONS 7, 8 and 9.
 Verskaf redes vir jou bewerings in VRAAG 7, 8 en 9.

QUESTION/VRAAG 7

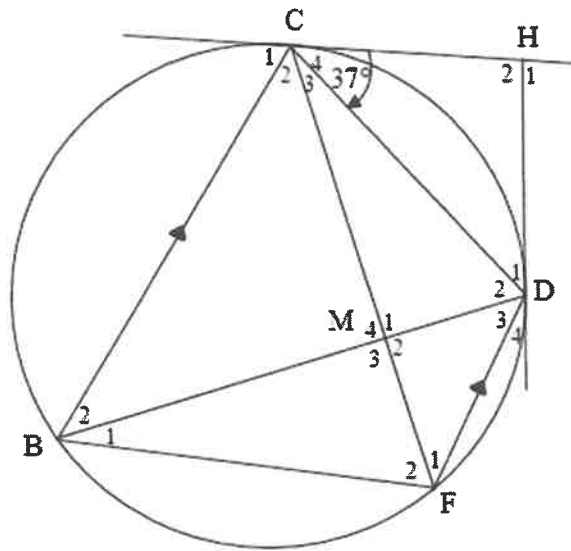
	Solution/Oplissing	Marks Punte
7.1		(1)

7.2



	Solution/Oplissing	Marks Punte
7.2.1		(1)
7.2.2		(5)
		[7]

QUESTION/VRAAG 8

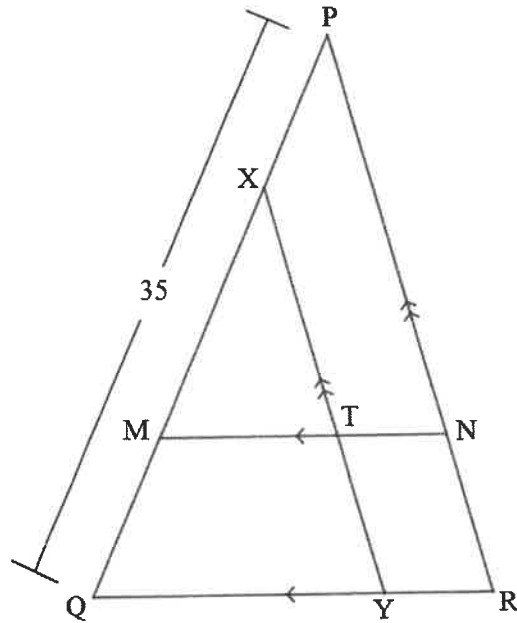


	Solution/Oplissing	Marks Punte
8.1		(4)
8.2		(4)
8.3		(3)
8.4		(4)
		[15]

QUESTION/VRAAG 9

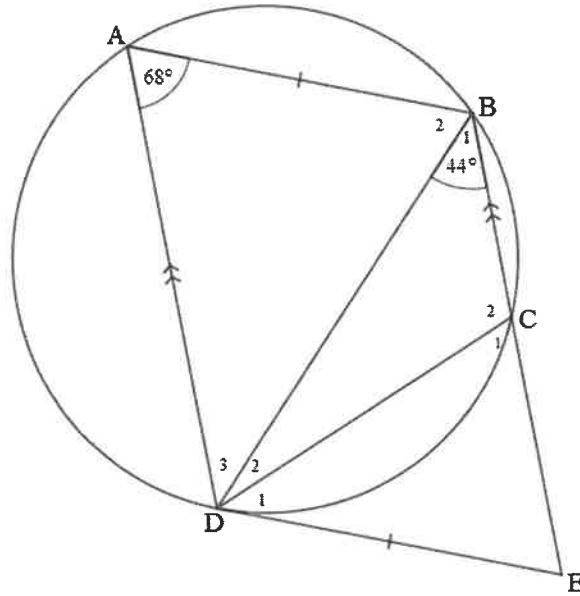
	Solution/Oplissing	Marks Punte
9.1		(1)

9.2



	Solution/Oplissing	Marks Punte
9.2.1		(4)
9.2.2		(5)

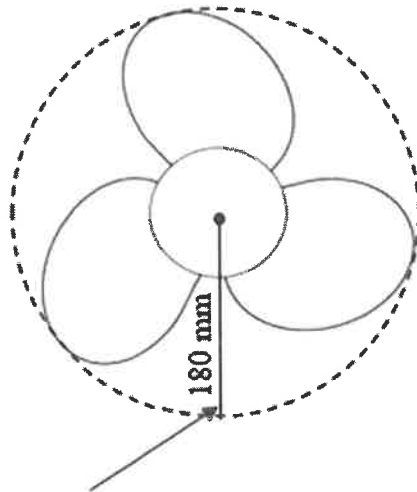
9.3



	Solution/Oplissing	Marks Punte
9.3.1		(4)
9.3.2		(2)
9.3.3		(3)
		[19]

QUESTION/VRAAG 10

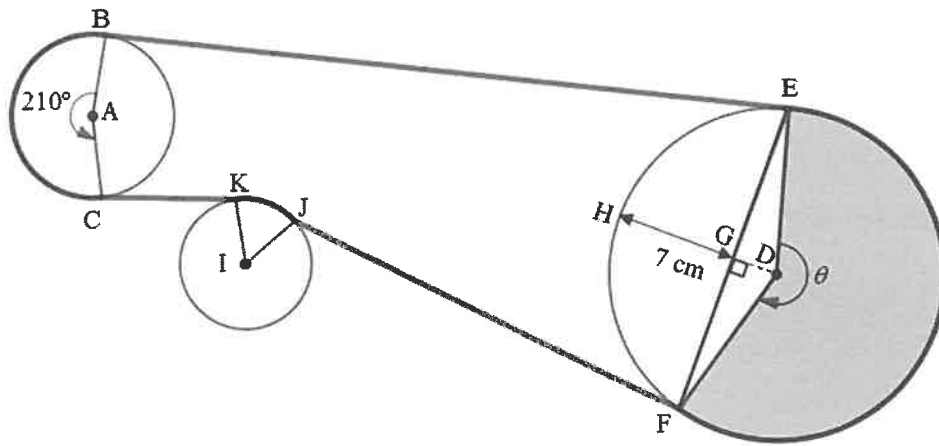
10.1



Radius of the circular path formed
by the rotating propeller blades/
*Radius van die sirkelpad gevorm
deur die roterende skroefblaaie*

	Solution/Oplissing	Marks Punte
10.1.1		(2)
10.1.2		(4)

10.2

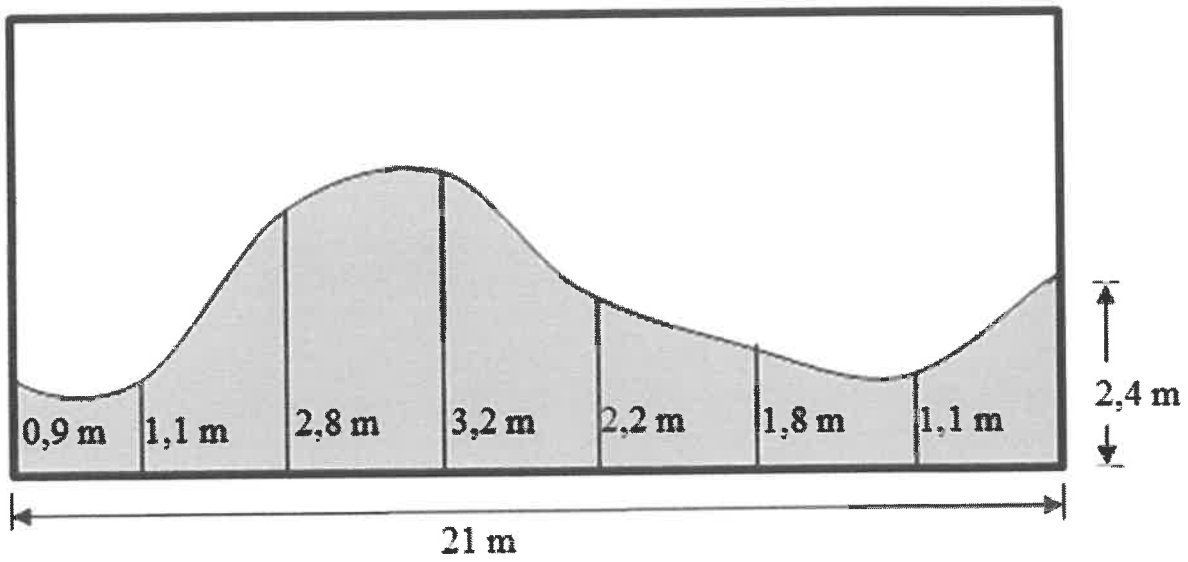


	Solution/Oplissing	Marks Punte
10.2.1		(1)
10.2.2		(3)
10.2.3		(3)
10.2.4		(3)

	Solution/Oplissing	Marks Punte
10.2.5		
		(5)
		[21]

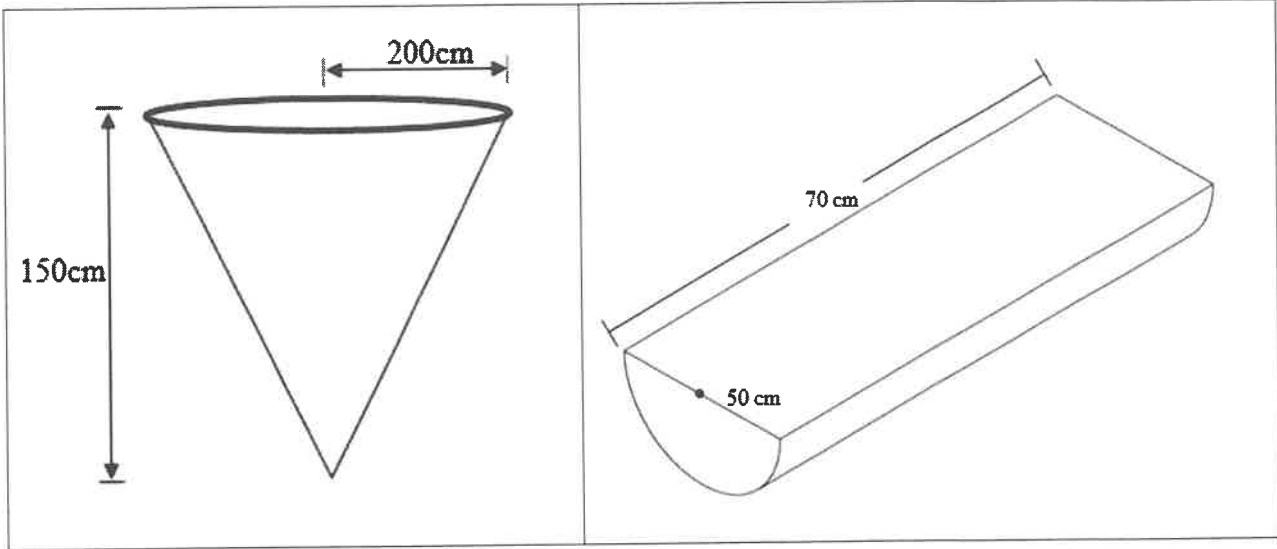
QUESTION/VRAAG 11

11.1



	Solution/Oplissing	Marks Punte
11.1.1		
		(4)
11.1.2		
		(2)

11.2



The following formulae may be used/Die volgende formules kan gebruik word:

Surface area of a cone = $\pi r s + \pi r^2$	Buite-oppervlakte van 'n keël = $\pi r s + \pi r^2$
Total surface area of a cylinder = $2\pi r^2 + 2\pi r h$	Totale buite-oppervlakte van 'n silinder = $2\pi r^2 + 2\pi r h$
Volume of a cone = $\frac{1}{3}\pi r^2 h$	Volume van 'n keël = $\frac{1}{3}\pi r^2 h$
Volume of a cylinder = $\pi r^2 h$	Volume van 'n silinder = $\pi r^2 h$

	Solution/Oplissing	Marks Punte
11.2.1		(3)
11.2.2		(5) [14]

TOTAL/TOTAAL: 150

	Additional space/Bykomende ruimte	Marks Punte

