



education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 10

MATHEMATICS P2

NOVEMBER 2024

MARKS: 100

TIME: 2 hours



This question paper consists of 10 pages, and a 13-page answer book.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of SEVEN questions.
2. Answer ALL questions in the SPECIAL ANSWER BOOK provided.
3. Clearly show ALL your calculations, diagrams, graphs, etc that you have used to determine the answer.
4. Answers only will NOT be necessarily 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. You may use an approved scientific calculator (non - programmable and non - graphical), unless stated otherwise.
8. Write neatly and legibly.



QUESTION 1

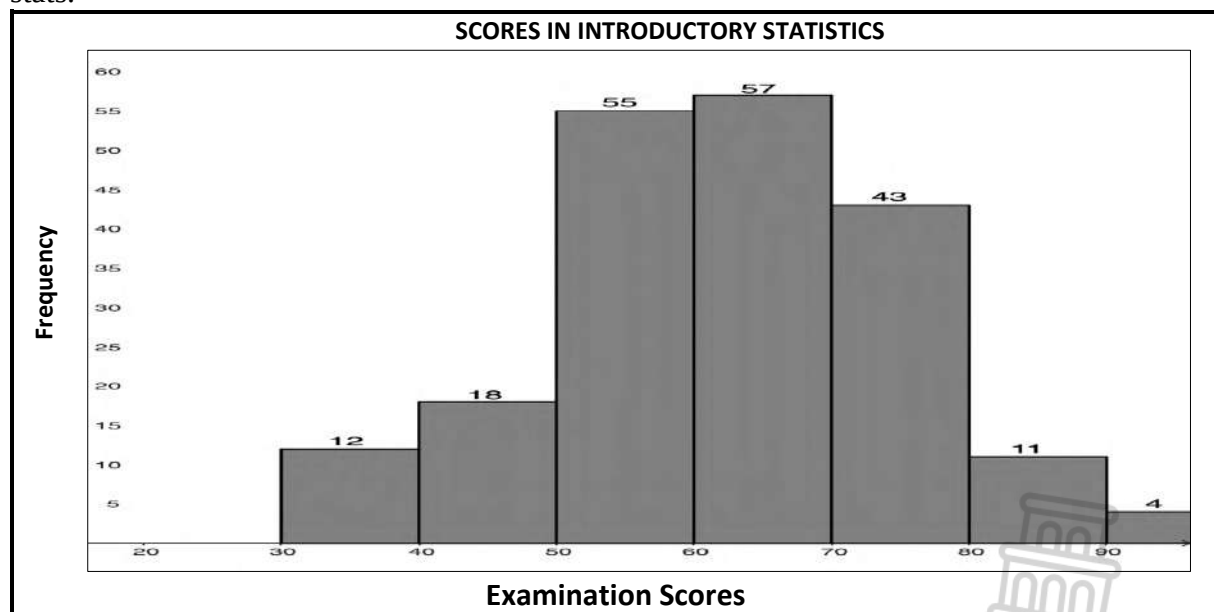
Mr Baloyi conducted a survey on the amount of airtime (in Rands) EACH learner had on his or her cellphone.

12	16	20	22	26	30	32	38	40	46	54	60	68
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- 1.1 Draw a box and whisker to represent the data. (3)
 - 1.2 Determine the interquartile range (IQR). (2)
 - 1.3 Calculate the range of the data. (2)
 - 1.4 Comment on the skewness of the data. (1)
- [8]**

QUESTION 2

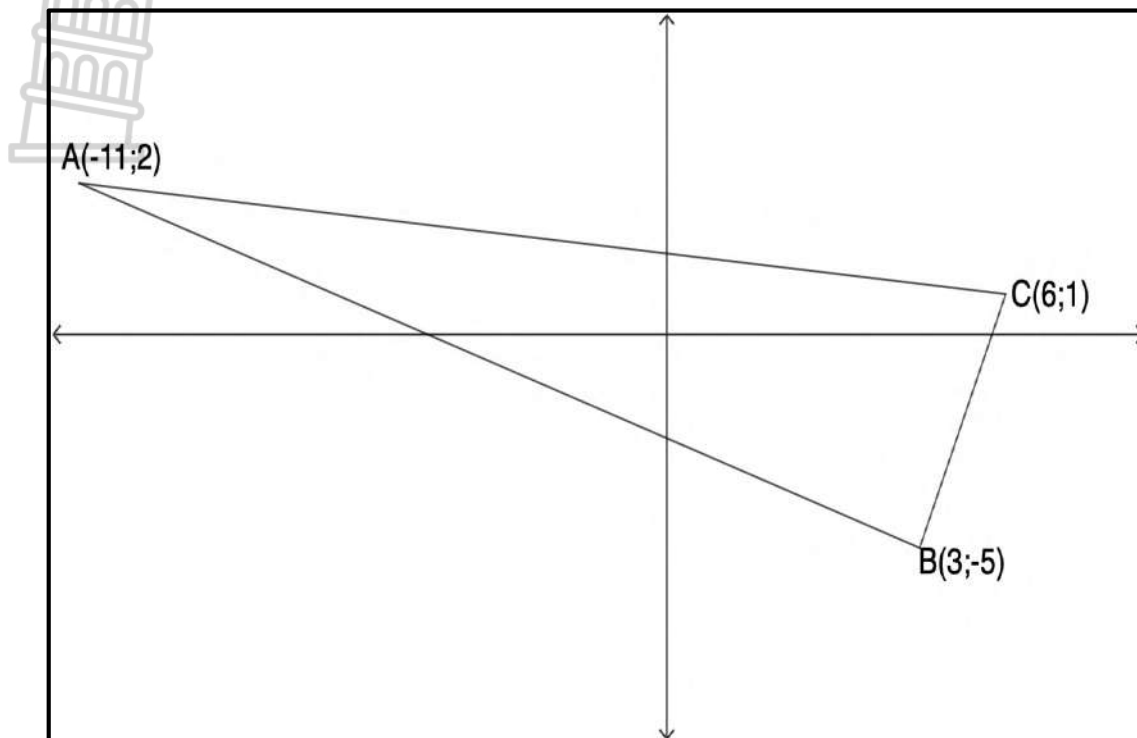
The histogram below shows the distribution of examination scores for learners in Introductory stats.



- 2.1 How many learners wrote the examination? (1)
 - 2.2 Identify the modal class of the data. (1)
 - 2.3 Estimate the mean of this data. Show all calculations. (4)
 - 2.4 Estimate the median mark obtained by the group. (2)
 - 2.5 In which interval does the upper quartile lie? (1)
- [9]**

QUESTION 3

In the figure, $\triangle ABC$ has vertices $A(-11;2)$, $B(3;-5)$ and $C(6;1)$.

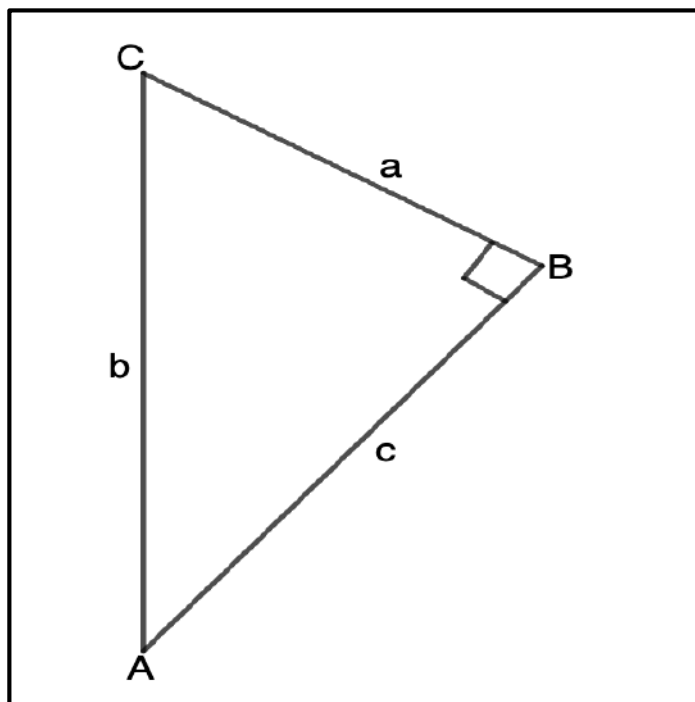


- 3.1 Calculate the length of BC. Leave the answer in surd form. (2)
- 3.2 Write down the coordinates of the midpoint D, of AB. (4)
- 3.3 Prove that $\hat{ABC} = 90^\circ$. (5)
- 3.4 Calculate the area of $\triangle ABC$. (4)
- [15]**



QUESTION 4

In the diagram is a right-angled triangle has sides a , b and c and the $\hat{B} = 90^\circ$.



4.1 Write down the following in terms of a , b and c .

4.1.1 $\sin A$ (1)

4.1.2 $\cot C$ (1)

4.1.3 If it is given that $a = 5$ and $A = 50^\circ$, calculate the numerical value of c . (3)

4.2 Given: $13\cos\theta = 12$, where $0^\circ \leq \theta \leq 90^\circ$, **without using a calculator**, use a sketch to determine the following.

4.2.1 $\sin \theta$ (4)

4.2.2 $\tan \theta - \operatorname{cosec}^2 \theta$ (3)

4.3 Simplify, **without the use of a calculator**.

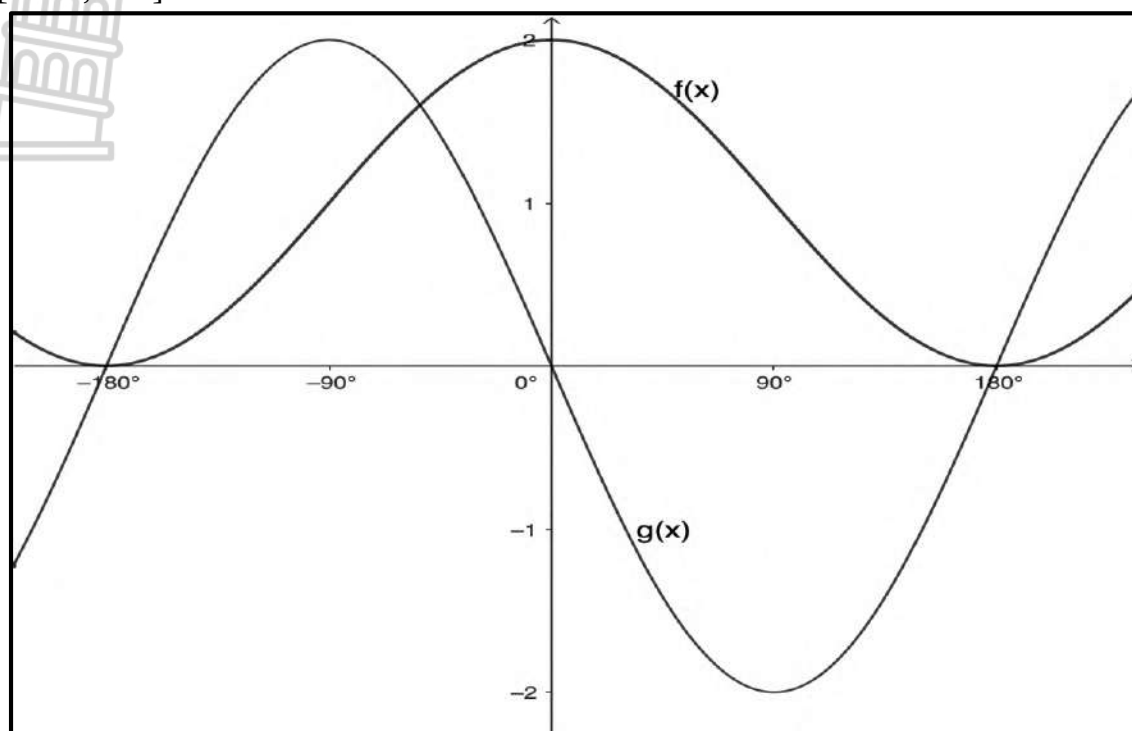
$\operatorname{cosec} 60^\circ \cdot \cot 30^\circ + \cos 45^\circ \cdot \operatorname{cosec} 45^\circ$. (5)

4.4 Solve for x , correct to two decimal places:

$3 + \sec x = 5$ and $0^\circ \leq x \leq 90^\circ$ (3)
[20]

QUESTION 5

In the diagram below, the graphs of $f(x) = \cos x + a$ and $g(x) = b \sin x$ are drawn for $x \in [-180^\circ; 180^\circ]$.

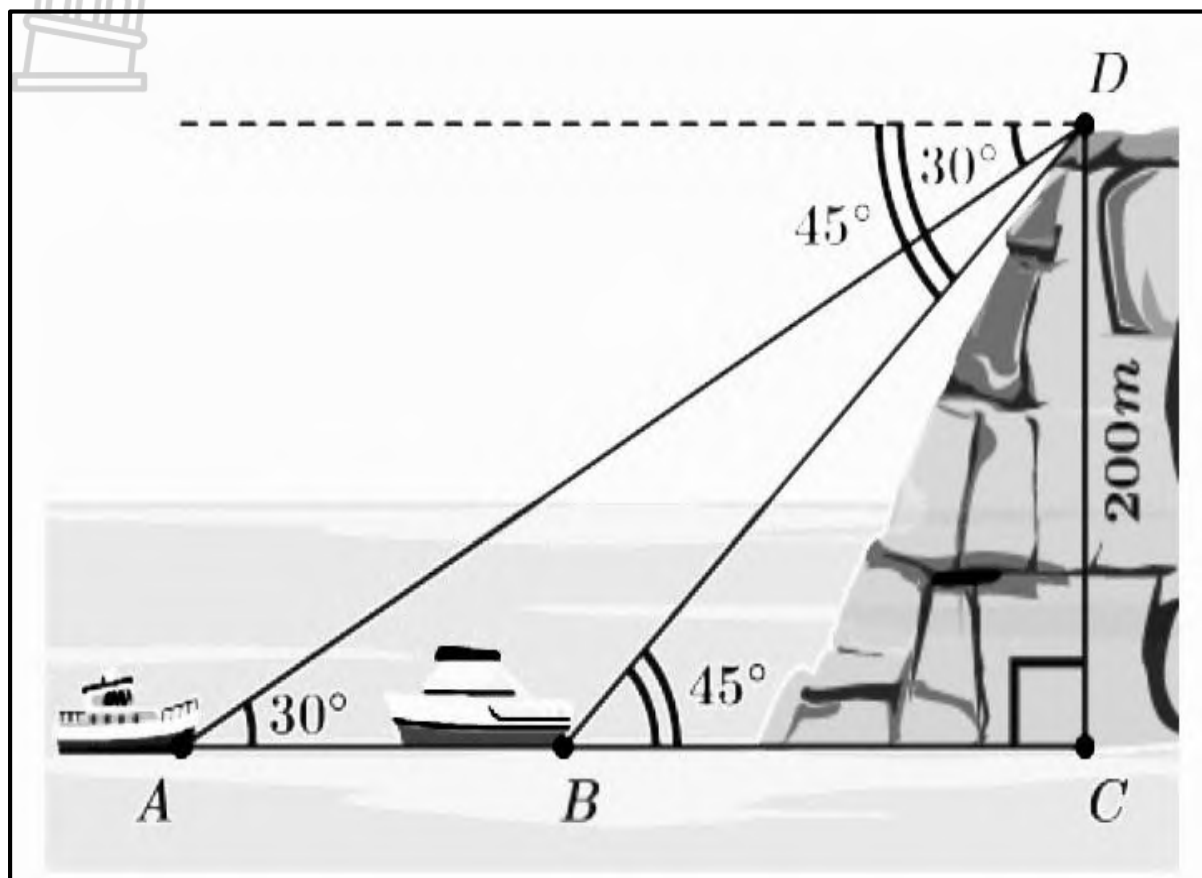


- 5.1 Write down the values of a and b . (2)
- 5.2 Write down the period of g . (1)
- 5.3 Determine the range of f . (2)
- 5.4 Write down the amplitude of g . (1)
- 5.5 Determine the number of solutions to $f(x) = g(x)$ for $-180^\circ < x < 180^\circ$. (1)
- 5.6 For which values of x is $g(x) < 0$. (2)
- 5.7 The graph of f is reflected about the x -axis and then moved 2 units downwards to form the graph of h . Determine:
 - 5.7.1 The equation of h (2)
 - 5.7.2 The range of h (2)

[13]

QUESTION 6

An observer on the top of a cliff, 200 m above the sea level, observes the angles of depression of the two ships to be 45° for ship A, and 30° for ship B, as shown below.



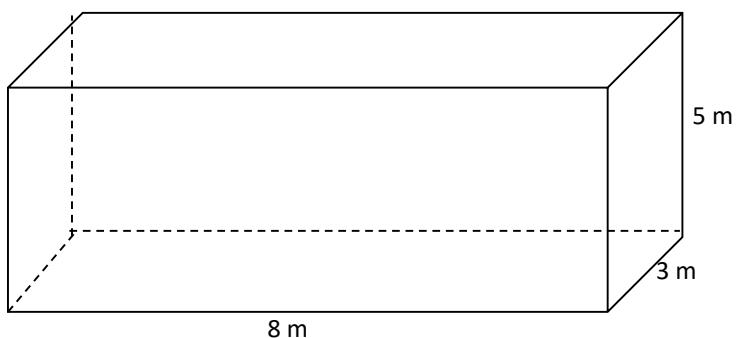
- 6.1 Determine the size of $\hat{BDC}$. (2)
 - 6.2 Calculate the length of BC. (2)
 - 6.3 Determine the distance between Ship A and Ship B. (4)
- [8]**

QUESTION 7

Given the rectangular prism below:

$$V = L.B.H$$

$$SA = 2(L.B) + 2(L.H) + 2(H.B)$$



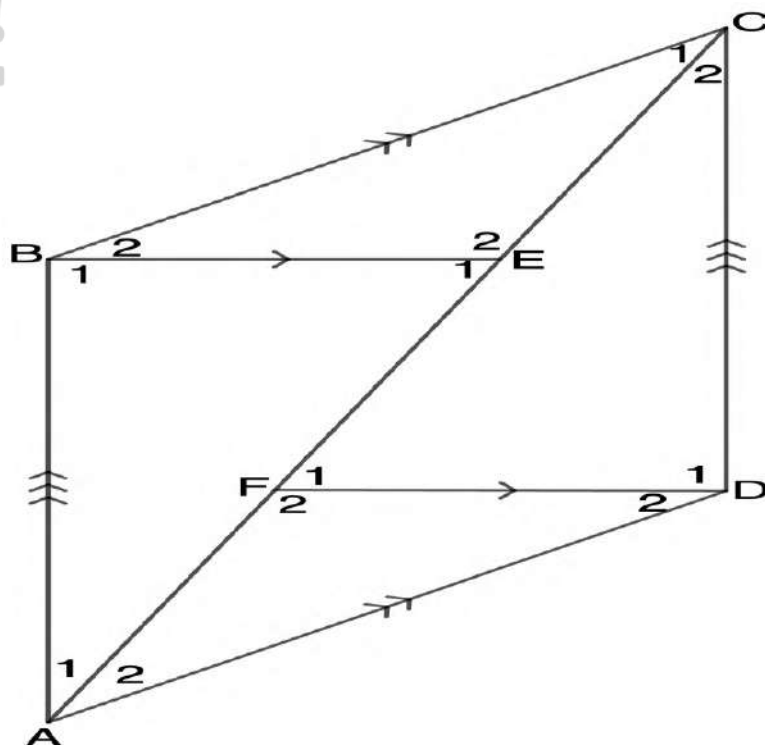
- 7.1 Calculate the surface area of the prism. (2)
- 7.2 Calculate the volume of the prism if the height is doubled and the breadth halved. (2)
- 7.3 Calculate the volume if the length is doubled, the height is halved and the breadth is tripled. (3)
- [7]



Give reasons for ALL geometry statements used in QUESTION 8 and 9.

QUESTION 8

ABCD is a parallelogram and AC is a diagonal, with A, F, E and C as colinear points.



8.1 Prove that:

8.1.1 $\triangle ABE \cong \triangle CDF$ (4)

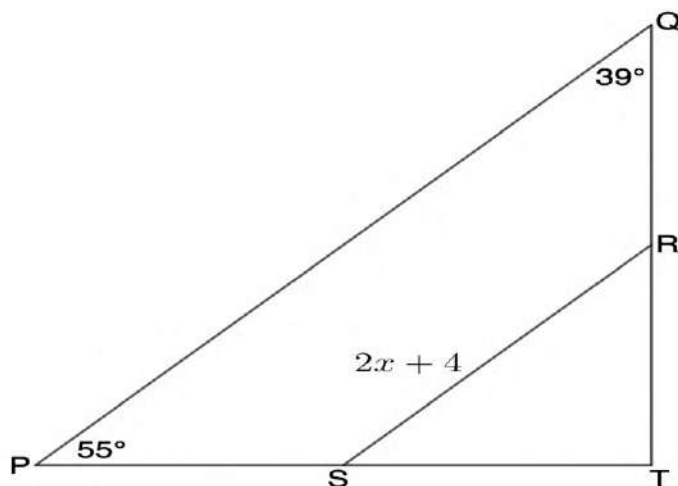
8.1.2 $\hat{CEB} = \hat{AFD}$ (3)

8.1.3 $AF = CE$ (3)

[10]

QUESTION 9

In the diagram below, R is the midpoint of QT and S is the midpoint of PT. The length of SR is $2x + 4$. $\hat{Q} = 39^\circ$ and $\hat{P} = 55^\circ$.



- 9.1 Determine the length of PQ in terms of x . (2)
- 9.2 If the length of PQ is 18, determine the value of x . (3)
- 9.3 Prove that $\triangle TRS \parallel \triangle TQP$ (5)
- [10]**

TOTAL : 100



education

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North West Provincial Government
REPUBLIC OF SOUTH AFRICA

NAME OF LEARNER: NAAM VAN LEERDER:	
CLASS: KLAS:	

MATHEMATICS P2/WISKUNDE V2

GRADE/GRAAD 10

NOVEMBER 2024

SPECIAL ANSWER BOOK

SPESIALE ANTWOORDEBOEK

QUESTION VRAAG	MARK PUNT	INITIAL PARAAF	MODERATION MODERERING	INITIAL PARAAF
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				
TOTAL TOTAAL (100)				

This answer book consists of 14 pages/*Hierdie antwoordeboek bestaan uit 14 bladsye.*

**PLEASE FOLLOW THESE INSTRUCTIONS
CAREFULLY**

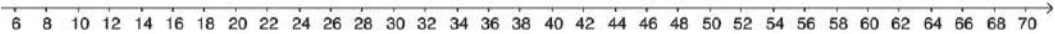
1. Answer ALL questions in the spaces provided.
2. No pages may be torn from this answer book.
3. Answers must be written in black/blue ink as distinctly as possible. Do not write in the margins.
4. If you require additional space for your answers:
 - 4.1. Use the additional space provided at the end of the answer book.
 - 4.2. When answering a question in the additional space, indicate clearly the question number in the column on the LHS.
 - 4.3. Rule off after each answer.
5. Draw a neat line through any work/rough work that must not be marked.

**VOLG ASSEBLIEF HIERDIE INSTRUKSIES
NOUKEURIG**

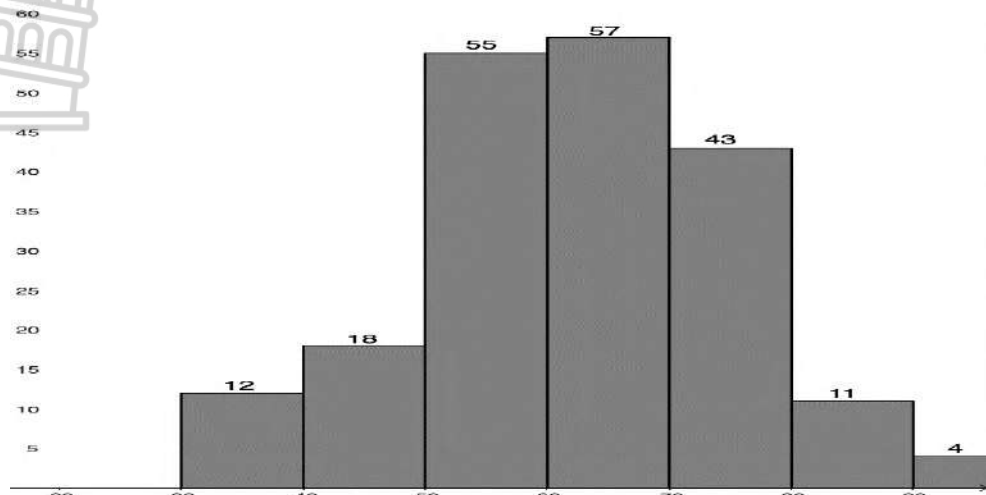
1. Beantwoord ALLE vrae in die ruimtes wat voorsien is.
2. Geen bladsye mag uit hierdie antwoordeboek geskeur word nie.
3. Skryf die antwoorde so duidelik moontlik met swart/blou ink. Laat die kantlyne oop.
4. Indien jy bykomende ruimte benodig vir jou antwoorde:
 - 4.1. Gebruik die bykomende ruimte wat aan die einde van die antwoordeboek voorsien word.
 - 4.2. As 'n vraag in die bykomende ruimte beantwoord word, dui duidelik die vraagnommer in die kolom aan die LK aan.
- 4.3. Trek 'n lyn na elke antwoord.
5. Trek 'n netjiese lyn deur enige werk/rofwerk wat nie nagesien moet word nie.



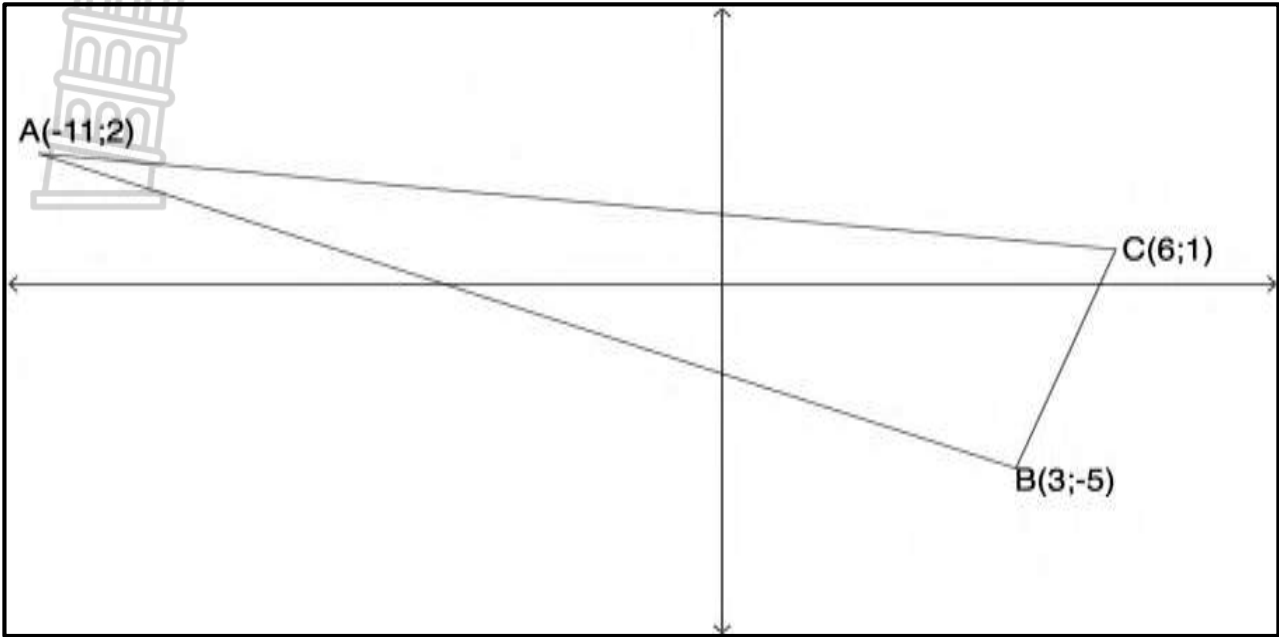
QUESTION 1/VRAAG 1

	Solution/Oplossing	MARKS/ PUNTE
1.1		(3)
1.2		(2)
1.3		(2)
1.4		(1)
		[8]

QUESTION 2/VRAAG 2

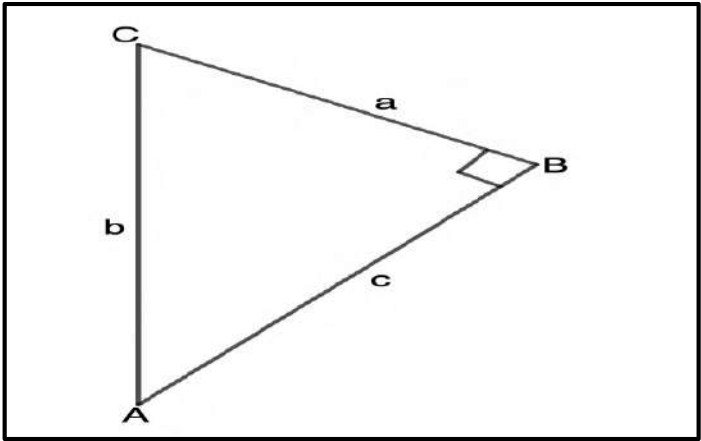
	TELLINGS IN INLEIDENDE STATISTIEKE		
			
	Eksamen tellings		
	Solution/Oplossing	MARKS/ PUNTE	
2.1		(1)	
2.2		(1)	
2.3		(4)	
2.4		(2)	
2.5		(1)	
		[9]	

QUESTION 3/VRAAG 3

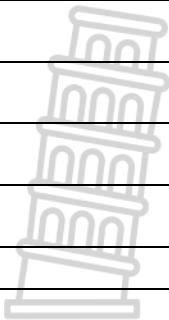


	Solution/ <i>Oplossing</i>	MARKS/ <i>PUNTE</i>
3.1		(2)
3.2		(4)
3.3		(5)
3.4		(4)
		[15]

QUESTION 4/VRAAG 4



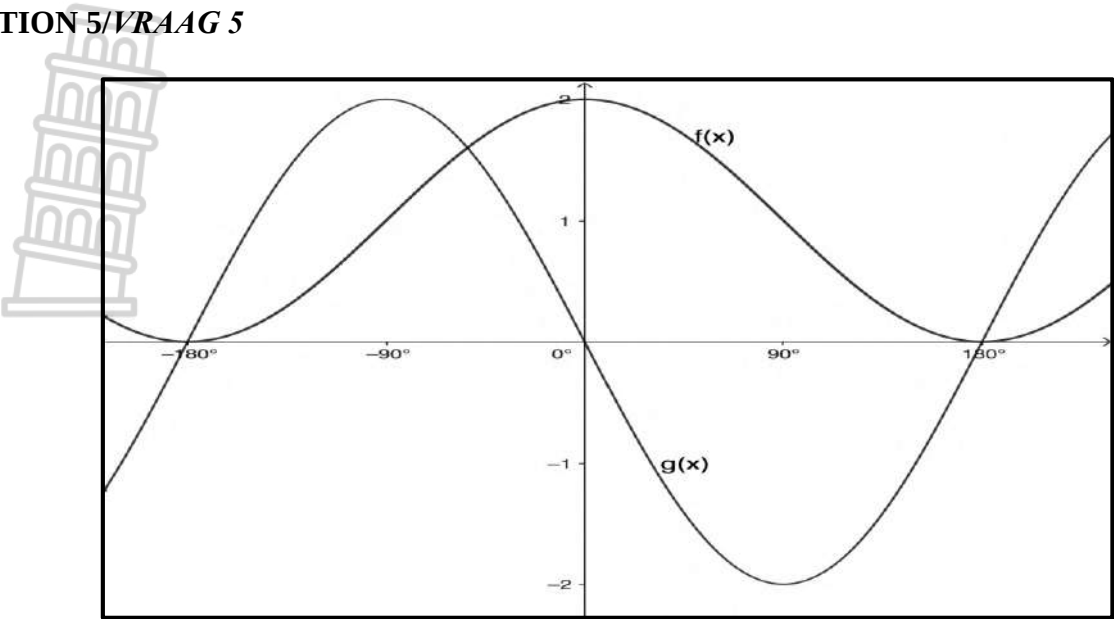
	Solution/Oplossing	MARKS/ PUNTE
4.1.1		(1)
4.1.2		(1)
4.1.3		(3)
4.2.1		(4)



	Solution/Oplossing	MARKS/ PUNTE
4.2.2		(3)

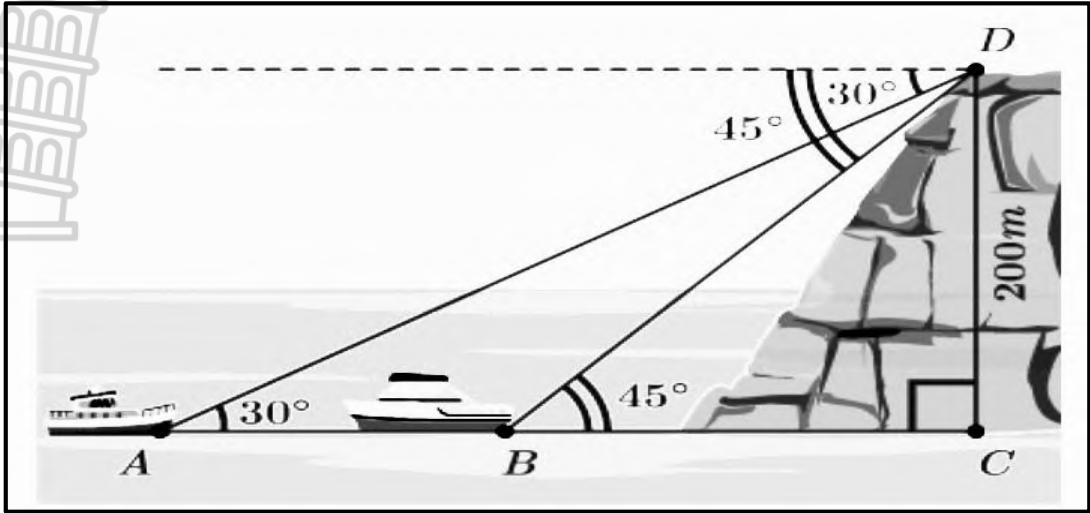
4.3		(5)
4.4		(3)
		[20]

QUESTION 5/VRAAG 5



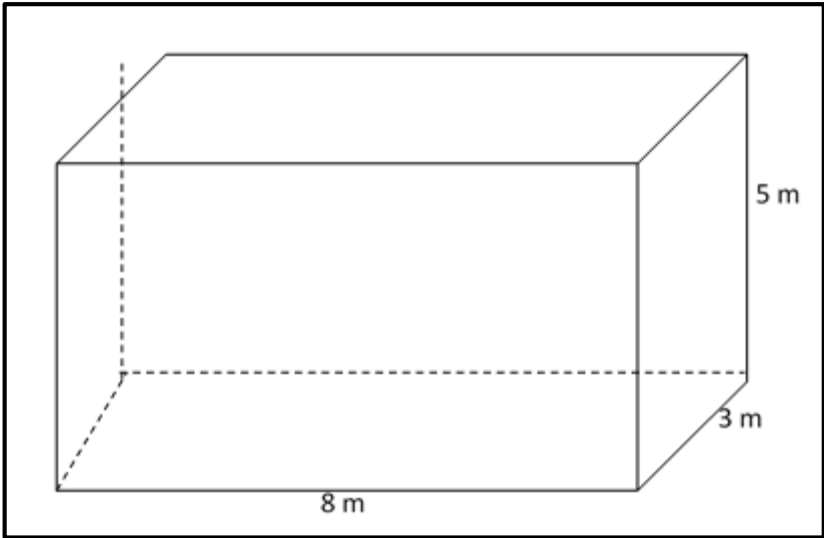
	Solution/Oplossing	MARKS/ PUNTE
5.1		(2)
5.2		(1)
5.3		(2)
5.4		(1)
5.5		(1)
5.6		(2)
5.7.1		(2)
5.7.2		(2)
		[13]

QUESTION 6/VRAAG 6



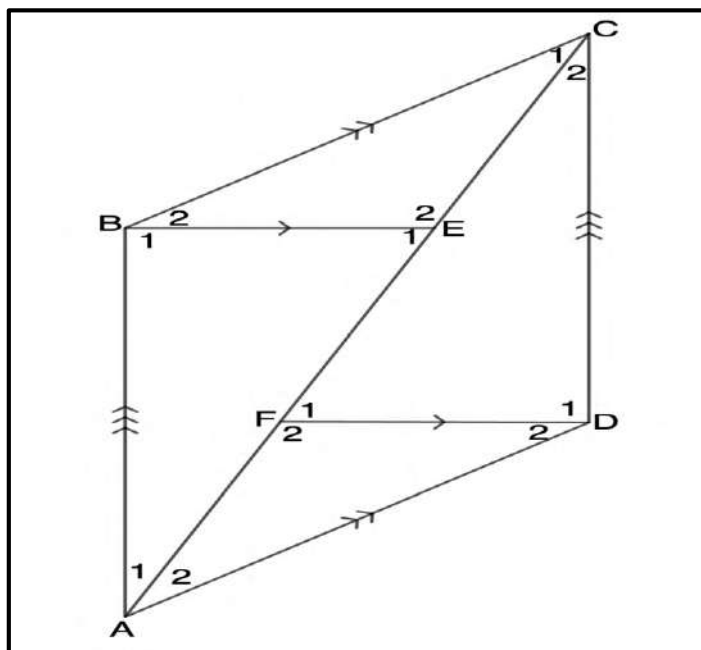
	Solution/Oplissing	MARKS/ PUNTE
6.1		(2)
6.2		(2)
6.3		(4)
		[8]

QUESTION 7/VRAAG 7



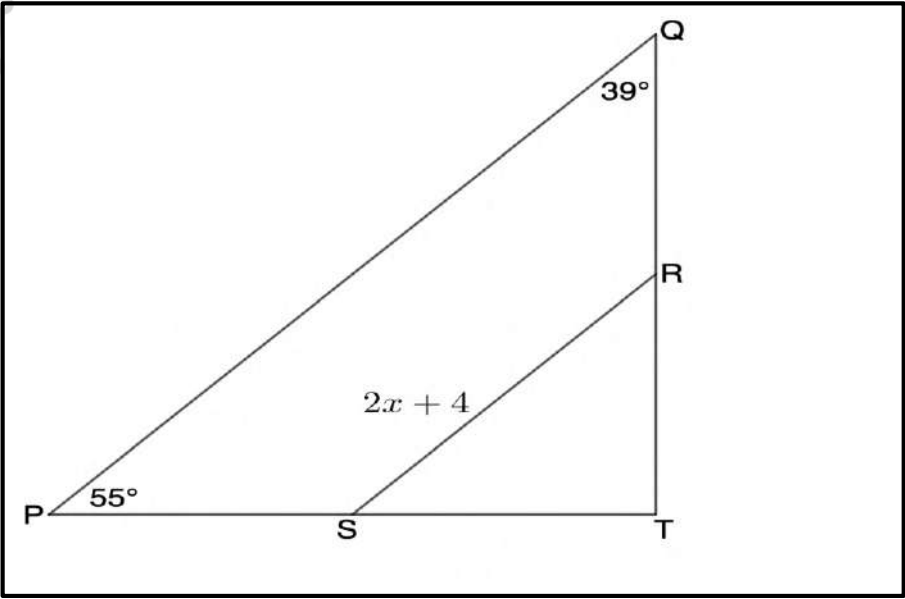
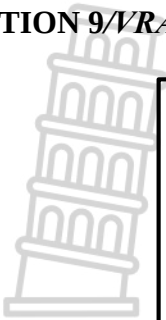
	Solution/Oplissing	MARKS/ PUNTE
7.1		(2)
7.2		(2)
7.3		(3)
		[7]

TION 8/VR4

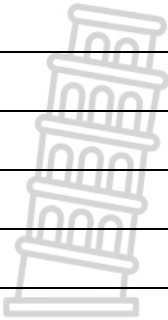
A stylized, light gray line drawing of the Leaning Tower of Pisa, tilted to the right. It has multiple levels of arches and a small flag on top.

	Solution/<i>Oplossing</i>	MARKS/ <i>PUNTE</i>
8.1.1		(4)
8.1.2		(3)
8.1.3		(3)
		[10]

QUESTION 9/VRAAG 9

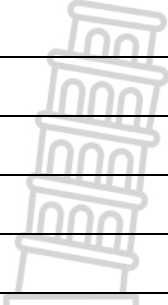


	Solution/Oplissing	MARKS/ PUNTE
9.1		(2)
9.2		(3)
9.3		(5)
		[10]
TOTAL/TOTAAL:		100



	<i>ADDITION</i>



	ADDITIONAL SPACE/ADDISIONELE SPASIE	
		





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PROVINCIAL ASSESSMENT

GRADE 10

**MATHEMATICS P2
NOVEMBER 2024
MARKING GUIDELINES**

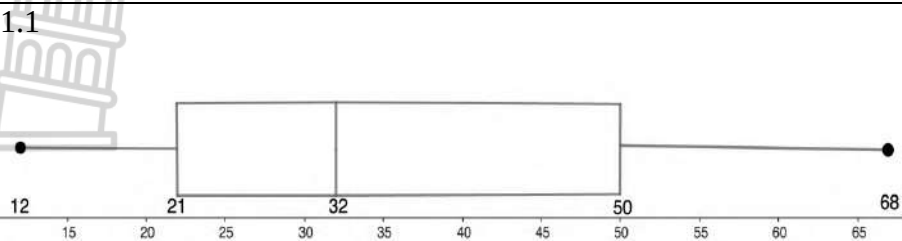
MARKS: 100

These marking guidelines consist of 10 pages.

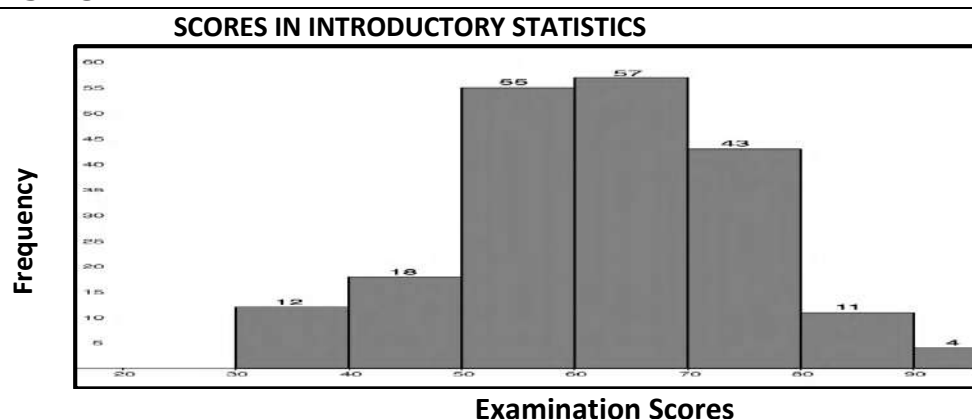


C.A is applicable in all aspects of the marking guidelines.

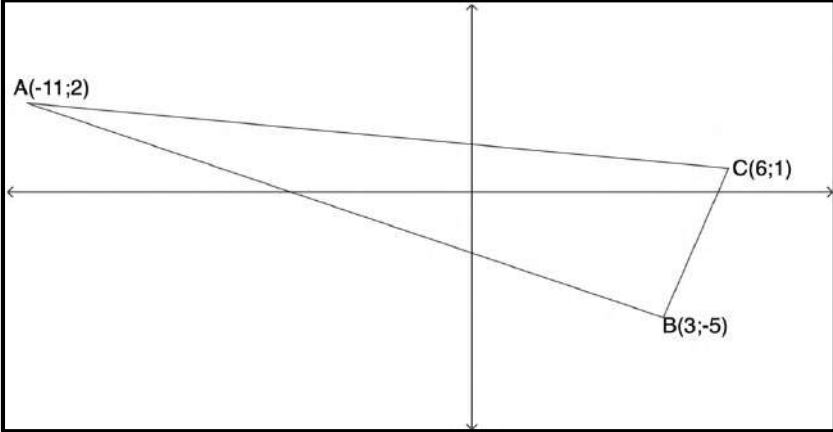
QUESTION 1

1.1		✓ min value,max value ✓ ✓(Combination) $Q_1 = 21$ $Q_2 = 32$ $Q_3 = 50$	(3)	
1.2	$IQR = Q_3 - Q_1$ $= 50 - 21$ $= 29$	Answer only full marks	✓ formula ✓ answer	(2)
1.3	Range = max val – min val $= 68 - 12$ $= 56$	Answer only full marks	✓ formula ✓ answer	(2)
1.4	The data is skewed to the right.		✓ answer	(1)
				[8]

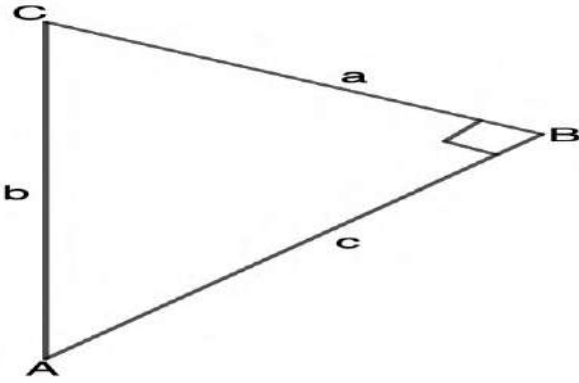
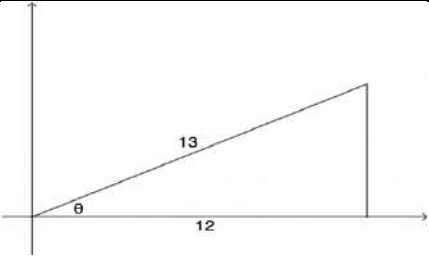
QUESTION 2



2.1	$n = 200$	✓ answer (1)																											
2.2	$60 < m \leq 70$	✓ answer (1)																											
2.3	<table><tr><th>Exam scores</th><th>Frequency</th><th>$x.f$</th></tr><tr><td>$30 < m \leq 40$</td><td>12</td><td>420</td></tr><tr><td>$40 < m \leq 50$</td><td>18</td><td>810</td></tr><tr><td>$50 < m \leq 60$</td><td>55</td><td>3025</td></tr><tr><td>$60 < m \leq 70$</td><td>57</td><td>3705</td></tr><tr><td>$70 < m \leq 80$</td><td>43</td><td>3225</td></tr><tr><td>$80 < m \leq 90$</td><td>11</td><td>935</td></tr><tr><td>$90 < m \leq 100$</td><td>4</td><td>380</td></tr><tr><td></td><td>200</td><td>12500</td></tr></table>	Exam scores	Frequency	$x.f$	$30 < m \leq 40$	12	420	$40 < m \leq 50$	18	810	$50 < m \leq 60$	55	3025	$60 < m \leq 70$	57	3705	$70 < m \leq 80$	43	3225	$80 < m \leq 90$	11	935	$90 < m \leq 100$	4	380		200	12500	✓ Addition (200) ✓ $x.f$ (12 500) ✓ substitution ✓ answer (4)
Exam scores	Frequency	$x.f$																											
$30 < m \leq 40$	12	420																											
$40 < m \leq 50$	18	810																											
$50 < m \leq 60$	55	3025																											
$60 < m \leq 70$	57	3705																											
$70 < m \leq 80$	43	3225																											
$80 < m \leq 90$	11	935																											
$90 < m \leq 100$	4	380																											
	200	12500																											

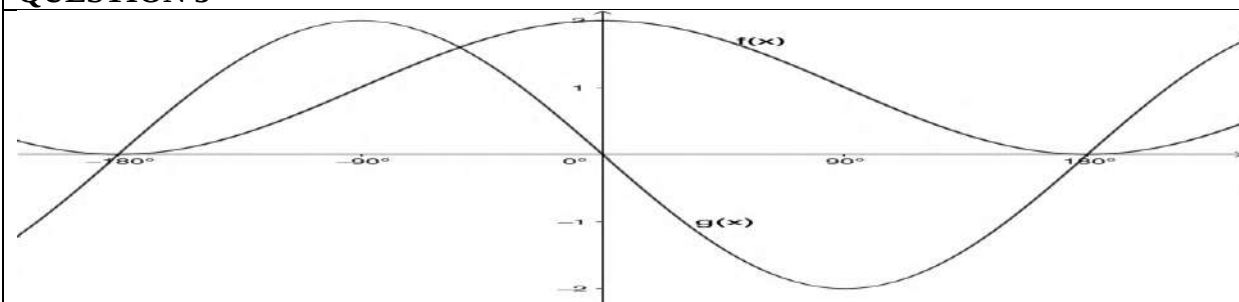
	$\frac{\sum xf}{n} = \frac{12500}{200}$ $= 62,5$	
2.4	Answer only full marks $\frac{n+1}{2} = \frac{200+1}{2}$ $= 100,5$ $Q_2 = 60 < m \leq 70$	✓ 100,5 ✓ answer (2)
2.5	$\frac{3(n+1)}{4} = \frac{3(200+1)}{4}$ $= 150,75 \text{ [position]}$ $70 < m \leq 80$	✓ answer (1)
QUESTION 3		[9]
		
3.1	$BC = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $= \sqrt{(6 - 3)^2 + (1 - (-5))^2}$ $= 3\sqrt{5}$	✓ sub ✓ answer (2)
3.2	$D = \left(\frac{x_1 + x_2}{2}; \frac{y_1 + y_2}{2} \right)$ $= \left(\frac{-11 + 3}{2}; \frac{2 + (-5)}{2} \right)$ $= \left(-4; -\frac{3}{2} \right)$	✓ formula ✓ sub ✓✓ midpoint (4)



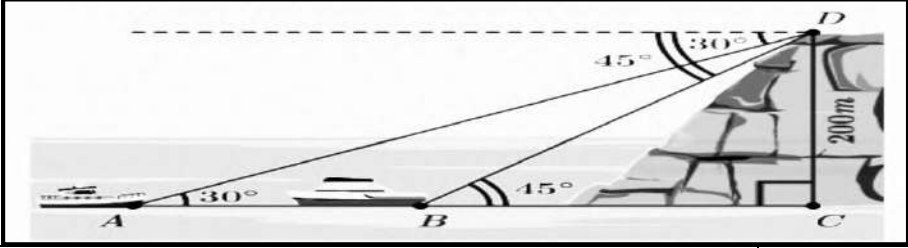
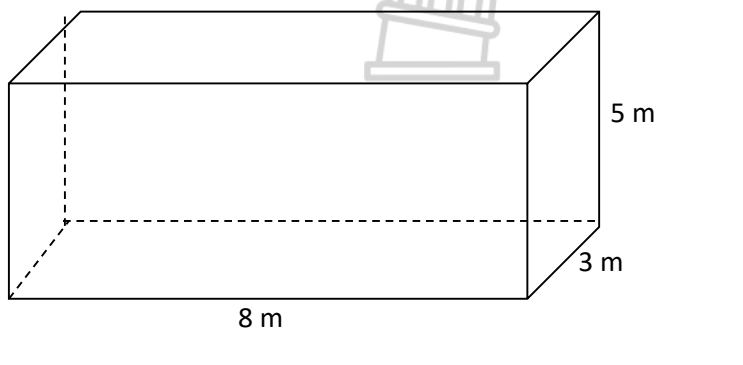
QUESTION 4		
		
4.1.1	$\sin A = \frac{a}{b}$	✓ answer (1)
4.1.2	$\cot C = \frac{a}{c}$	✓ answer (1)
4.1.3	$\hat{C} = 40^\circ$ – sum of $\angle$'s of a Δ . $\cot C = \frac{a}{c}$ $\cot 40^\circ = \frac{5}{c}$ $c = \frac{5}{\cot 40^\circ}$ $c = 4.20$	✓ S/R ✓ sub ✓ $c = 4.20$ (3)
4.2.1	$13 \cos \theta = 12$ $\cos \theta = \frac{12}{13}$ $r^2 = x^2 + y^2$ $(13)^2 = (12)^2 + y^2$ $5 = y$ $\sin \theta = \frac{5}{13}$	 ✓ $\cos \theta = \frac{12}{13}$ ✓ diagram ✓ $5 = y$ ✓ $\sin \theta = \frac{5}{13}$ (4)
4.2.2	$\tan \theta - \operatorname{cosec}^2 \theta$ $= \left(\frac{5}{12} - \left(\frac{13}{5} \right)^2 \right)$ $= -\frac{1903}{300} = -6,34$	✓ $\frac{5}{12}$ ✓ $\frac{13}{5}$ ✓ answer (3)

4.3	$\operatorname{cosec} 60^\circ \cdot \cot 30^\circ + \cos 45^\circ \cdot \operatorname{cosec} 45^\circ$ $= \frac{2}{\sqrt{3}} \cdot \sqrt{3} + \frac{1}{\sqrt{2}} \cdot \sqrt{2}$ $= 2 + 1$ $= 3$	$\checkmark \frac{2}{\sqrt{3}}$ $\checkmark \sqrt{3}$ $\checkmark \frac{1}{\sqrt{2}}$ $\checkmark \sqrt{2}$ $\checkmark 3$
4.4	$3 + \sec x = 5$ $\sec x = 2$ $\frac{1}{\cos x} = 2$ $\cos x = \frac{1}{2}$ $x = \cos^{-1}\left(\frac{1}{2}\right)$ $x = 60$	$\checkmark \sec x = 2$ $\checkmark \frac{1}{\cos x} = 2$ $\checkmark x = 60$
		(5)
		(3)
		[20]

QUESTION 5

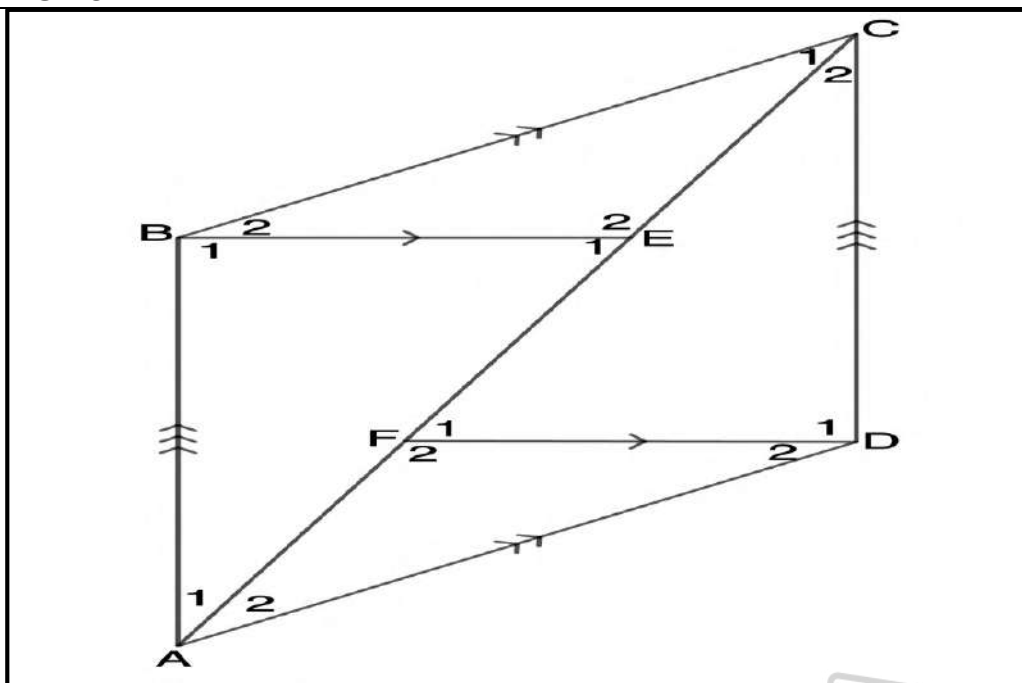


5.1	$a = 1$ $b = -2$	$\checkmark a = 1$ $\checkmark b = -2$
5.2	360°	$\checkmark$ answer (1)
5.3	$y \in [0; 2]$ or $0 \leq y \leq 2$	$\checkmark \checkmark y \in [0; 2]$ or $0 \leq y \leq 2$ (combination) (2)
5.4	2	$\checkmark$ answer (1)
5.5	1 solution	$\checkmark$ answer (1)
5.6	$0^\circ < x < 180^\circ$ or $x \in (0^\circ; 180^\circ)$	$\checkmark \checkmark 0^\circ < x < 180^\circ$ or $(0^\circ; 180^\circ)$ (combination) (2)
5.7.1	$h(x) = -\cos x - 3$	$\checkmark -\cos x$ $\checkmark -3$
5.7.2	$y \in [-4; -2]$ or $-4 \leq y \leq -2$	$\checkmark \checkmark$ Answer (Combination) (2)
		[13]
QUESTION 6		

		
6.1	$\hat{B} + \hat{C} + \hat{BDC} = 180^\circ$ – sum of $\angle$'s of a Δ $45^\circ + 90^\circ + \hat{BDC} = 180^\circ$ $\hat{BDC} = 180^\circ - 45^\circ - 90^\circ$ $\hat{BDC} = 45^\circ$	✓S/R ✓answer (2)
6.2	$\tan B = \frac{DC}{BC}$ $\tan 45^\circ = \frac{200}{BC}$ $BC = 200\text{m}$ OR $BC = 200\text{m}$ – sides opp = angles	✓sub ✓answer ✓ S / R (2)
6.3	$\tan \hat{A} = \frac{CD}{AC}$ $\tan 30^\circ = \frac{200}{AC}$ $AC = \frac{200}{\tan 30^\circ}$ $AC = 346.41$ $AC - BC = AB$ $346.41 - 200 = AB$ $146.41 = AB$	✓ratio ✓ $AC = 346.41 / 200\sqrt{3}$ ✓Difference ✓answer (4)
[8]		
QUESTION 7		
$V = L.B.H$ $SA = 2(L.B) + 2(L.H) + 2(H.B)$		

7.1	$= 2(8 \times 5) + (2(3 \times 5)) + 2(3 \times 8)$ $= 158m^2$	✓ substitution ✓ answer (2)
7.2	$V = L.B.H$ $= 8 \times 3 \times 5$ $= 120m^3$	✓ substitution ✓ answer (2)
7.3	$V = L.B.H$ $16 \times 9 \times 2,5$ $360 m^3$	✓ ✓ 16 x 9 x 2,5 ✓ answer (3)
		[7]

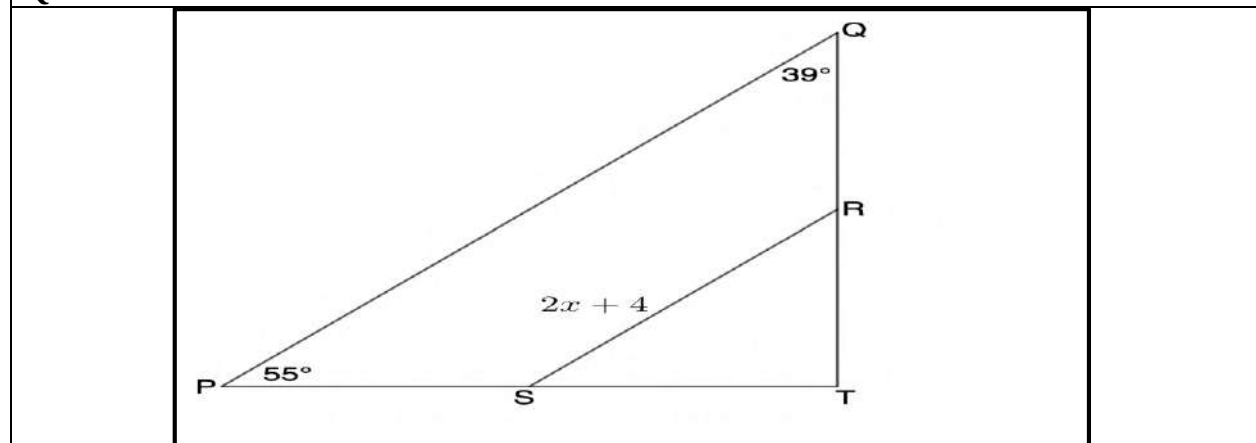
QUESTION 8



8.1.1	$AB = CD$ – opp side of parm are = $\hat{A}_1 = \hat{C}_2$ – alt $\angle$'s $AB \parallel CD$ $\hat{E}_1 = \hat{F}_1$ – alt $\angle$'s $BE \parallel FD$ $\therefore \triangle ABE \equiv \triangle CDF, AAS$	✓ S/R ✓ S/R ✓ S/R ✓ Conclusion (4)
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8.1.2	$\hat{C}_1 = \hat{A}_2$ – alt $\angle$'s $BC \parallel AD$ (A) $\hat{B} = \hat{D}$ – opp $\angle$'s of a parm $\hat{B}_1 = \hat{D}_1$ – proven ($\triangle ABE \equiv \triangle CDF$) $\hat{B}_2 = \hat{D}_2$ – (A) $\hat{F}_2 = \hat{E}_2$ – sum of $\angle$'s of a Δ	$\checkmark$ S/R $\checkmark$ S/R $\checkmark$ S/R (3)
8.1.3	$\hat{C}_1 = \hat{A}_2$ – proven $\hat{B}_2 = \hat{D}_2$ – proven $BC = AD$ – opp sides of parm are = $\therefore \triangle CBE \equiv \triangle ADF$, AAS $AF = CE$ – congruent Δ	$\checkmark$ S/R $\checkmark$ S/R $\checkmark$ conclusion (3)
[10]		

QUESTION 9



9.2	$18 = 4x + 8$ $18 - 8 = 4x$ $\frac{10}{4} = \frac{5}{2} = x$	$\checkmark 18 = 4x + 8$ $\checkmark 10 = 4x$ $\checkmark$ answer (3)
9.3	RS is a midpoint $\therefore SR \parallel PQ$ $\hat{Q} = \hat{R} = 39^\circ$ – corr $\angle$'s $SR \parallel PQ(A)$ $\hat{P} = \hat{S} = 55^\circ$ – corr $\angle$'s $SR \parallel PQ(A)$ $\hat{T} = \hat{T}$ – common $\angle(A)$ $\therefore \triangle TRS \parallel \triangle TQP, AAA$	$\checkmark S \checkmark R$ $\checkmark S \checkmark R$ $\checkmark$ conclusion (5)
		[10]
TOTAL : 100		

