



GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION

JUNE 2023

GRADE 10

MATHEMATICS

PAPER 2

TIME: 1 hour

MARKS: 50

5 pages



INSTRUCTIONS

Read the following instructions carefully before answering the questions.

1. This question paper consists of FOUR questions.
2. Answer ALL the questions.
3. Clearly show ALL calculations, diagrams, graphs etc., which were used in determining the answers.
4. Answers only will NOT necessarily be awarded full marks.
5. Use an approved scientific calculator (non-programmable and non-graphical), unless otherwise stated.
6. Where necessary, answers should be rounded-off to TWO decimal places, unless stated otherwise.
7. Diagrams are NOT necessarily drawn to scale.
8. Number the questions correctly according to the numbering system used in this question paper.
9. Write neatly and legibly.



**QUESTION 1**

1.1 If $A = 38,6^\circ$ and $B = 141,4^\circ$, determine the following:

$$\cos 2A - \sin\left(\frac{1}{2}B\right) \quad (3)$$

1.2 Calculate θ where $0^\circ \leq \theta \leq 90^\circ$. Round-off to ONE decimal place:

1.2.1 $\sin 2\theta = 0,4$ (2)

1.2.2 $3\sin\left(\frac{\theta}{2} - 20^\circ\right) = 0,85$ (4)

1.3 Calculate the following without the use of a calculator:

1.3.1 $\sin^2 45^\circ - \cos 60^\circ$ (3)

1.3.2 $(\sin 30^\circ)^{\tan 45^\circ}$ (3)

[15]**QUESTION 2**

2.1 Draw neat sketch graphs of $f(x) = -\sin x$ and $g(x) = \frac{1}{2} \cos x$; where $x \in [0^\circ ; 360^\circ]$. (6)

2.2 Determine the amplitude of $f(x)$. (2)

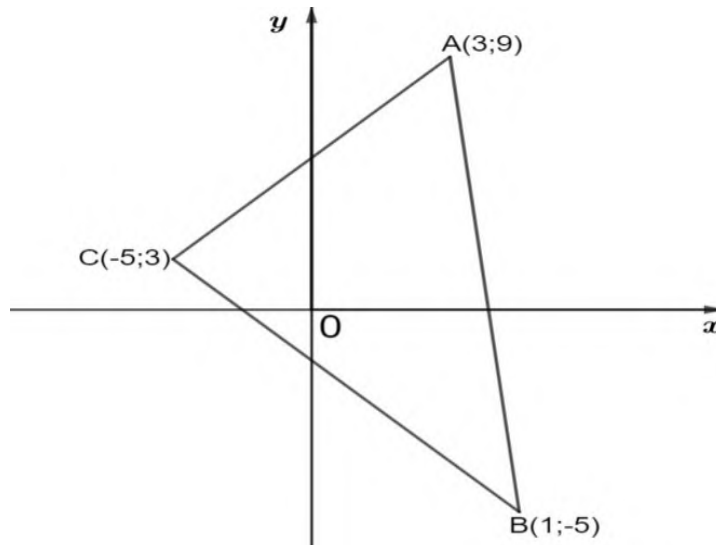
2.3 What is the period of $g(x)$? (1)

2.4 For which value(s) of x is $-\sin x - \cos x = 1$? (1)

[10]

QUESTION 3

Study the diagram below and answer the questions that follow.

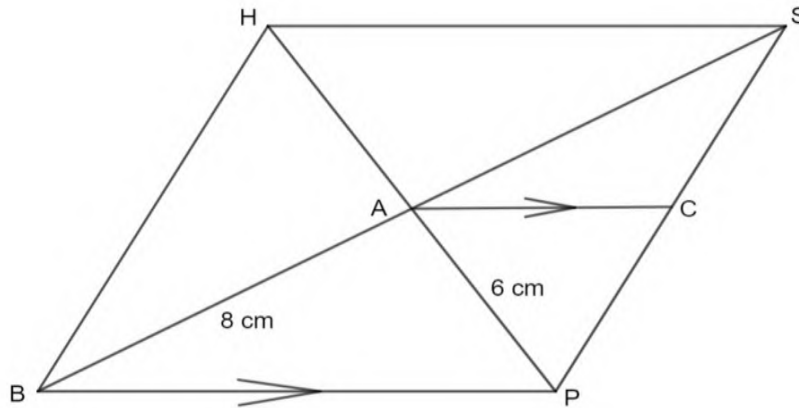


- 3.1 Calculate the coordinates of the midpoint of the line segment AB. (3)
- 3.2 Calculate the gradient of the line:
- 3.2.1 AC (2)
- 3.2.2 CB (2)
- 3.3 Show that AC is perpendicular to CB. (1)
- 3.4 Determine the length of the line segment:
- 3.4.1 AC (2)
- 3.4.2 CB (2)
- 3.5 Determine the area of $\triangle ABC$. (2)

[14]

QUESTION 4

BHSP is a rhombus whose diagonals intersect at point A. $BA = 8$ cm and $AP = 6$ cm. The line AC is drawn parallel to BP as shown in the diagram below.



- 4.1 Write down the size of the angle \hat{BAP} . (2)
- 4.2 Calculate the size the length of BP. (3)
- 4.3 Write down the length of AC (2)
- 4.4 Determine the area of quadrilateral BHSP. (4)

[11]

TOTAL: 50



PROVINCIAL EXAMINATION

PROVINSIALE EKSAMEN

JUNE/*JUNIE* 2023

GRADE/*GRAAD* 10

MARKING GUIDELINES

NASIENRIGLYNE

MATHEMATICS/*WISKUNDE* (PAPER/*VRAESTEL 2*)

6 pages/*bladsye*



QUESTION/VRAAG 1

1.1		$\cos 2A - \sin\left(\frac{1}{2}B\right)$ $\cos 2(38,6) - \sin\left(\frac{1}{2}\right)141,4^\circ$ $= 0,2215 \dots - 0,9438 \dots$ $= -0,72$	✓ 0,2215 ✓ 0,9438 ✓ Answer/Antwoord	(3)
1.2	1.2.1	$\sin 2\theta = 0,4$ $2\theta = 23,178$ $= 23,2^\circ$	✓ $2\theta = 23,178$ ✓ Answer/Antwoord	(2)
	1.2.2	$3\sin\left(\frac{\theta}{2} - 20^\circ\right) = 0,85$ $\sin\left(\frac{\theta}{2} - 20^\circ\right) = 0,28333333$ $\frac{\theta}{2} - 20^\circ = 16,459 \dots$ $\frac{\theta}{2} = 36,459$ $\theta = 72,9^\circ$	✓ 0,28333333 ✓ $16,459 \dots^\circ$ ✓ $36,459 \dots^\circ$ ✓ Answer/Antwoord	(4)
1.3	1.3.1	$\sin^2 45^\circ - \cos 60^\circ$ $= \frac{1}{2} - \frac{1}{2}$ $= 0$	✓ Substitution/Vervang ✓ Substitution/Vervang ✓ Answer/Antwoord	(3)
	1.3.2	$(\sin 30^\circ)^{\tan 45^\circ}$ $= \left(\frac{1}{2}\right)^1$ $= \frac{1}{2}$	✓ Substitution/Vervang ✓ Substitution/Vervang ✓ Answer/Antwoord	(3)
				[15]

QUESTION/VRAAG 2

2.1		<ul style="list-style-type: none"> ✓ $f(x)$ – shape/vorm ✓ $g(x)$ – shape/vorm ✓ $(90^\circ ; 0)$ ✓ $(180^\circ ; -\frac{1}{2})$ ✓ $(0^\circ ; 0)$ ✓ $(0^\circ ; \frac{1}{2})$ 	(6)
2.2	$\frac{1+1}{2}$ $= 1$	<ul style="list-style-type: none"> ✓ Max. – Min/Maks – Min ✓ Answer/Antwoord 	(2)
2.3	360°	✓ Answer/Antwoord	(1)
2.4	1	✓ Answer/Antwoord	(1)
			[10]

QUESTION/VRAAG 3

3.1.	$M\left(\frac{x_1 + x_2}{2} ; \frac{y_1 + y_2}{2}\right)$ $M\left(\frac{3+1}{2} ; \frac{9+(5)}{2}\right)$ $M(2 ; 2)$	<ul style="list-style-type: none"> ✓ Correct sub into formula/ Korrekte vervang in formule ✓ $x = 2$ ✓ $y = 2$ 	(3)
3.2	<p>3.2.1</p> $m_{AC} = \frac{y_1 - y_2}{x_2 - x_1}$ $= \frac{9-3}{3-(-5)}$ $m_{AC} = \frac{3}{4}$	<ul style="list-style-type: none"> ✓ Substitution/Vervang ✓ $M_{AC} = \frac{3}{4}$ 	(2)
	<p>3.2.2</p> $m_{BC} = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{-5-3}{1-(-5)}$ $m_{BC} = \frac{4}{3}$	<ul style="list-style-type: none"> ✓ Substitution/Vervang ✓ $m_{BC} = \frac{4}{3}$ 	(2)

3.3	$\therefore \frac{3}{4} \times \frac{4}{3} = -1$	✓ product of gradients/ <i>produk van gradiënte</i>	(1)
3.4	3.4.1 $AC = \sqrt{(-5-3)^2 + (3-9)^2}$ $AC = \sqrt{100}$ $AC = 10 \text{ cm}$	✓ Substitution/ <i>Vervang</i> ✓ AC	(2)
	3.4.2 $CB = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$ $CB = \sqrt{(1 - (-5))^2 + (-5 - 3)^2}$ $CB = \sqrt{100} = 10 \text{ cm}$	✓ Substitution/ <i>Vervang</i> ✓ BC	(2)
3.5	\therefore Area of $\triangle ABC = \frac{1}{2} \times \text{base/basis} \times \text{height/hoogte}$ Area of $\triangle ABC = \frac{1}{2} \times 10 \times 10$ Area of $\triangle ABC = 50 \text{ cm}^2$	✓ Substitution/ <i>Vervang</i> ✓ Answer/ <i>Antwoord</i>	(2)
			[14]



QUESTION/VRAAG 4

4.1	$\hat{BAP} = 90^\circ$ diagonals of a rhombus bisect at 90° / <i>hoeklyne van 'n ruit halveer op 90°</i>	✓ S ✓ R	(2)
4.2	$BP^2 = BA^2 + AP^2$ Pythagoras $BP^2 = 8^2 + 6^2$ $BP = 10 \text{ cm}$	✓ S ✓ R ✓ Answer/Antwoord	(3)
4.3	$AC = \frac{1}{2} BP$ line drawn from midpoint parallel to 2 nd side/ <i>lyn getrek vanaf middelpunt parallel met die 2^{de} sy</i> $AC = 5 \text{ cm}$	✓ S ✓ R	(2)
4.4	Area of/Oppv van $\triangle BAP = \frac{1}{2} \times AB \times AP$ $= \frac{1}{2} \times 8 \times 6$ $= 24 \text{ cm}^2$ \therefore Area of/Oppv van $\triangle BHSP = 4 \times$ Area of/Oppv van $\triangle BAP$ $= 4 \times 24$ $= 96 \text{ cm}^2$	✓ sub into area formula/ <i>vervang in oppv formule</i> ✓ Area of a triangle/ <i>Oppv van driehoek</i> ✓ method/metode ✓ Answer/Antwoord	(4)
			[11]
TOTAL/TOTAAL:			50



TAXONOMY LEVELS					
GRADE 10					
MATHEMATICS					
June 2023					
QUESTION	KNOWLEDGE	ROUTINE PROCEDURES	COMPLEX PROCEDURES	PROBLEM SOLVING	TOTAL
DESIRED %	20%	35%	30%	15%	100%
1.1	3				
1.2.1		2			
1.2.2			4		
1.3.1		3			
1.3.2		3			
2.1.			6		
2.2		2			
2.3		1			
2.4		1			
3.1		3			
3.2		5			
3.3		6			
4.1		2			
4.2		3			
4.3		2			
4.4			3	4	
Total	3	33	14		50
Actual %	18	66	26		100
Desired %	20%	35%	30%	15%	100