Downloaded from Stanmorephysics.com

GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION

JUNE 2024

GRADE 10

MATHEMATICS

(PAPER 2)

TIME: **1 hour**

MARKS: **50**

6 pages

Downloaded from Stanmorephysics.com

INSTRUCTIONS AND INFORMATION

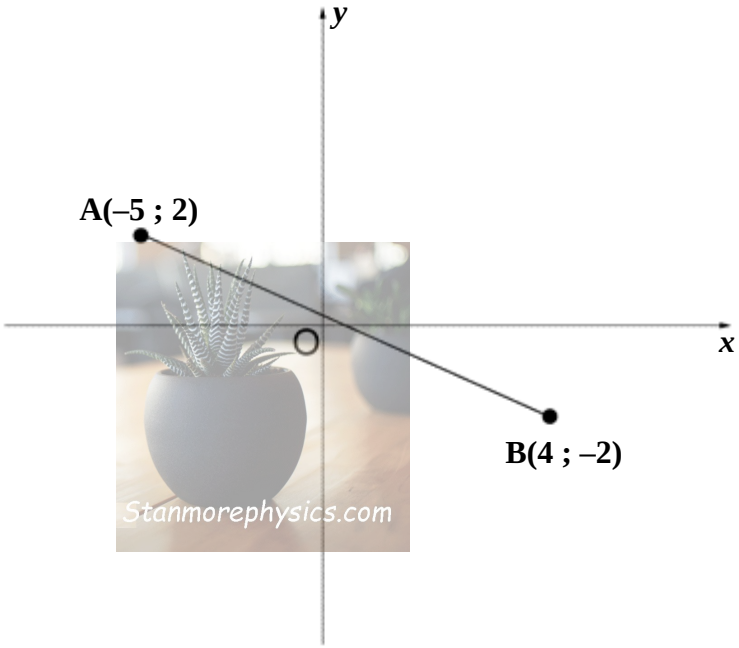
Read the following instructions carefully before answering the questions.

1. This question paper consists of 5 questions.
2. Answer ALL the questions.
3. Clearly show ALL calculations, diagrams, graphs etc. that you have used to determine the answers.
4. Answers only will NOT necessarily be awarded full marks.
5. You may use an approved scientific calculator (non-programmable and non-graphical), unless stated otherwise.
6. If necessary, round-off answers to TWO decimal places, unless stated otherwise.
7. Diagrams are NOT necessarily drawn to scale.
8. Write neatly and legibly.

Downloaded from Stanmorephysics.com

QUESTION 1

In the figure below, $A(-5\,;\,2)$ and $B(4\,;-2)$ are points on a line segment AB.



1.1 Determine the length of AB. (3)

1.2 Determine the coordinates of the midpoint of AB. (3)

1.3 Determine the gradient of line AB. (3)

1.4 Point A undergoes a certain transformation to a point A' such that the gradient of the line A'B becomes undefined.

Describe the transformation that maps point A to A'. (2)

[11]

QUESTION 2

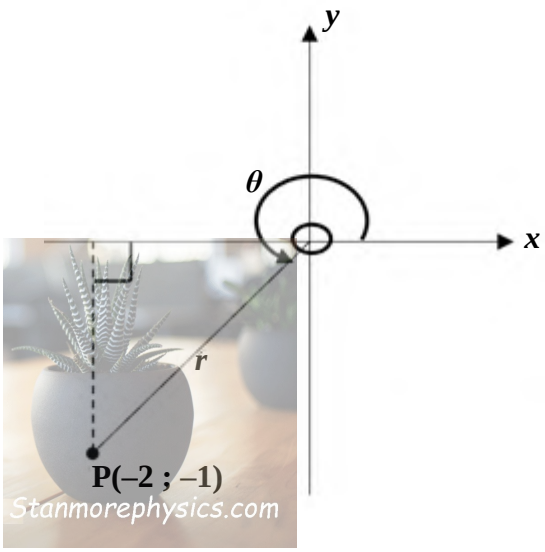
2.1 If $A = 78°$ and $B = 34°$, calculate the values of the following expressions, correct to two decimal places.

2.1.1 $\sin A - \sin B$ (2)

2.1.2 $\sqrt[3]{\sec A}$ (2)

Downloaded from Stanmorephysics.com

2.2 In the diagram below, point P$(-2; -1)$ lies in the third quadrant. OP $= r\ cm$. The axes intersect at O, which represents the origin on the sketch.



Using the sketch and **without using a calculator**, calculate the:

2.2.1 Length of OP. (2)

2.2.2 Value of $\sqrt{5}\cos\theta + 4\,cosec^2\theta$ (4)

2.3 Evaluate **without using a calculator**:

$$\frac{\sin 45°}{\frac{\sqrt{2}}{2}.\tan^2 30°}$$

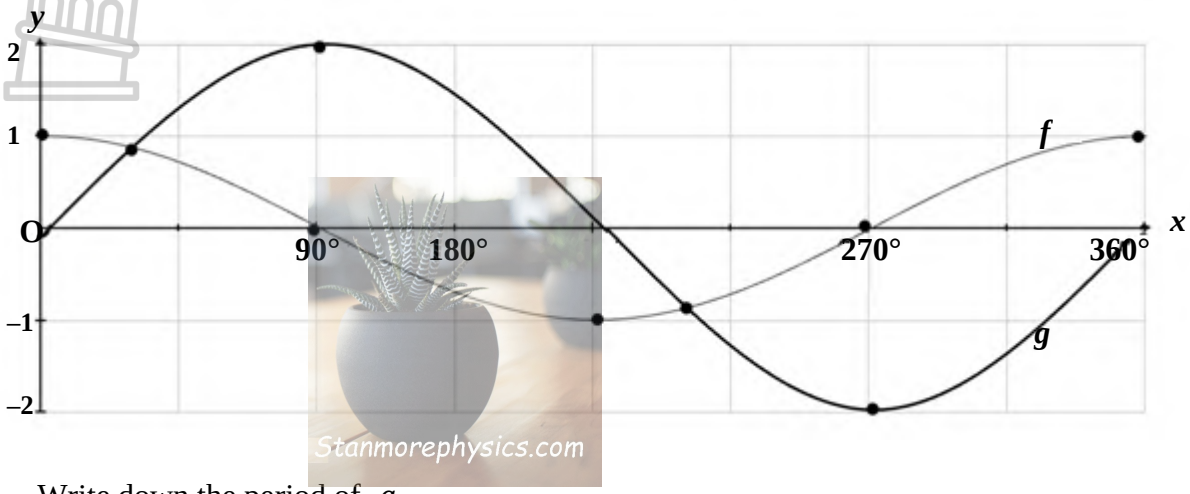
(3)

[13]

Downloaded from Stanmorephysics.com

QUESTION 3

The sketch below shows the graph of $f(x) = \cos x$ and $g(x) = 2\sin x$ for the interval $x \in [0°; 360°]$.



Stanmorephysics.com

3.1 Write down the period of g. (1)

3.2 For which value(s) of x will $f(x) \geq 0$? (2)

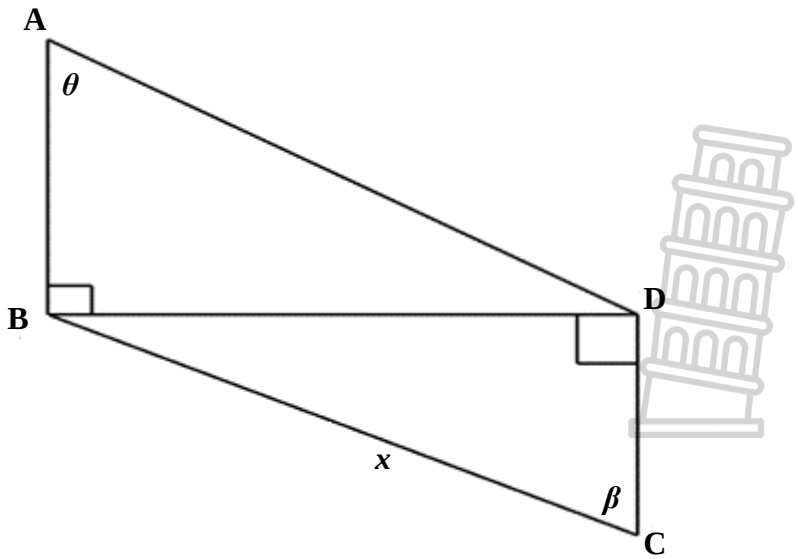
3.3 Determine the range of $m(x)$ if $m = -4f(x) + 1$. (3)

[6]

QUESTION 4

In the diagram below, $\hat{A} = \theta$ and $A\hat{B}D = 90°$. BC $= x$ m, $\hat{C} = \beta$ and $B\hat{D}C = 90°$.

.



4.1 Show that AB $= \dfrac{x \sin \beta}{\tan \theta}$ (4)

4.2 Hence, or otherwise, calculate the length of AB, correct to two decimal places, if $\theta = 52°$; $\beta = 40°$ and $x = 12$ m. Write your answer to the nearest whole number. (2)

[6]

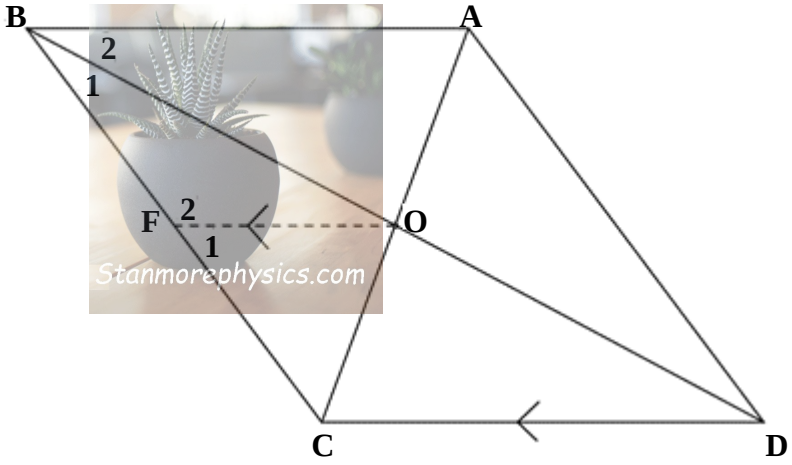
Downloaded from Stanmorephysics.com

QUESTION 5

5.1 Complete the theorem:

The line segment joining the midpoints of two sides of a triangle is … and …
(Write down the missing words only.) (2)

5.2 ABCD is a rhombus with the diagonals AC = 16 cm and DB = 30 cm.



5.2.1 Calculate the length of BC. (4)

5.2.2 Calculate OF, if OF is parallel to DC with F on BC. (3)

5.2.3 Determine the size of $O\hat{B}F$ if $O\hat{F}C = 64°$. (3)

5.3 Determine the area of the rhombus ABCD (2)

[14]

TOTAL: 50

END

Downloaded from Stanmorephysics.com

GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION

PROVINSIALE EKSAMEN

JUNE/*JUNIE* 2024

GRADE/*GRAAD* 10

MARKING GUIDELINES
NASIENRIGLYNE

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

5 pages/*bladsye*

Downloaded from Stanmorephysics.com

	INSTRUCTIONS/*INSTRUKSIES*:
	• **If a candidate answers the question TWICE, only mark the first attempt.** ***As 'n kandidaat die vraag TWEE KEER beantwoord, sien slegs die eerste poging na.*** • **If a candidate has crossed out an attempted answer and not redone the answer, mark the crossed out version.** ***As 'n kandidaat 'n poging van 'n antwoord deurgehaal het en nie die antwoord oorgedoen het nie, sien die deurgehaalde weergawe na.*** • **Consistent accuracy applies in ALL aspects of the marking guidelines. Stop marking at the second calculation error.** ***Konsekwente akkuraatheid geld in ALLE aspekte van die nasienriglyne. Hou op nasien by die tweede berekeningsfout.*** • **Assuming answer/values to solve a problem is NOT acceptable.** ***Om antwoorde/waardes te aanvaar om 'n probleem op te los, is NIE aanvaarbaar nie.***
	GEOMETRY/*MEETKUNDE*
S	**A mark for a correct statement** **(A statement mark is independent of a reason)** ***'n Punt vir 'n korrekte stelling*** ***('n Stellingpunt is onafhanklik van 'n rede)***
R	**A mark for a correct reason** **(A reason mark only to be awarded if the statement is correct)** ***'n Punt vir 'n korrekte rede*** ***('n Redepunt moet slegs toegeken word indien die stelling korrek is)***
S/R	**Award a mark if the statement AND the reason are both correct** ***Ken 'n punt toe as die stelling EN die rede albei korrek is***

QUESTION/*VRAAG* 1

	Suggested solution/*Voorgestelde oplossing*	Explanation/*Verduideliking*	
1.1	$AB = \sqrt{(x_A - x_B)^2 + (y_A - y_B)^2}$ $= \sqrt{(-5-4)^2 + (2+2)^2}$ $= \sqrt{97}$	✓ Formula/*Formule* ✓ Substitution/*Vervanging* ✓ Answer/*Antwoord*	(3)
1.2	$= M\left(\frac{x_A + x_B}{2}; \frac{y_A + y_B}{2}\right)$ $= M\left(\frac{-5+4}{2}; \frac{2-2}{2}\right)$ $= M\left(-\frac{1}{2}; 0\right)$	✓ Formula/*Formule* ✓ Substitution/*Vervanging* ✓Answer/*Antwoord*	(3)
1.3	$m_{AB} = \frac{y_A - y_B}{x_A - x_B}$ $= \frac{2-(-2)}{-5-4}$ $= -\frac{4}{9}$	✓ Formula/*Formule* ✓ Substitution/*Vervanging* ✓ Answer/*Antwoord*	(3)

Downloaded from Stanmorephysics.com

1.4		Horisontal transformation of 9 units to the right/ *Horisontale transformasie van 9 eenhede na regs*	✓ Answer/*Antwoord*	(2)
				[11]
QUESTION/*VRAAG* 2				
2.1	2.1.1	$\sin A - \sin B$ $= \sin 78° - \sin 34°$ $= 0{,}42$	✓ Substitution/*Vervanging* ✓ Answer/*Antwoord*	(2)
	2.1.2	$\sqrt[3]{\sec A}$ $= \sqrt[3]{\frac{1}{\cos 78°}}$ $= 1{,}69$	✓ $\frac{1}{\cos 78°}$ ✓ Answer/*Antwoord*	(2)
2.2	2.2.1	$r^2 = (-2)^2 + (-1)^2$ Pythagoras $\therefore r = \sqrt{5}$	✓ Substitution/*Vervanging* ✓ Answer/*Antwoord*	(2)
	2.2.2	$\sqrt{5}\cos\theta + 4\,cosec^2\,\theta$ $= \sqrt{5}\cos\theta + \frac{4}{\sin^2\theta}$ $= \sqrt{5}\left(-\frac{2}{\sqrt{5}}\right) + \frac{4}{\left(-\frac{1}{\sqrt{5}}\right)^2}$ $= 18$	✓ $\frac{1}{\sin^2\theta}$ ✓ subs/*verv* $-\frac{2}{\sqrt{5}}$ ✓ subs/*verv* $\left(-\frac{1}{\sqrt{5}}\right)^2$ ✓ Answer/*Antwoord*	(4)
2.3		$\frac{\sin 45°}{\frac{\sqrt{2}}{2}.\tan^2 30°}$ $= \frac{\frac{1}{\sqrt{2}}}{\frac{\sqrt{2}}{2}\times\left(\frac{1}{\sqrt{3}}\right)^2}$ $= 3$	✓ $\frac{1}{\sqrt{2}}$ ✓ $\left(\frac{1}{\sqrt{3}}\right)^2$ ✓ Answer/*Antwoord*	(3)
				[13]

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG* 3			
3.1	Period/*Periode* $= 360°$	✓ Answer/*Antwoord*	(1)
3.2	$0° \leq x \leq 90°$ or/*of* $270° \leq x \leq 360°$ **OR/*OF*** $\therefore x \in [0°; 90°] \cup [270°; 360°]$	✓ $0° \leq x \leq 90°$ ✓ $270° \leq x \leq 360°$ **OR/*OF*** ✓ $x \in [0°; 90°]$ ✓ $\cup [270°; 360°]$	(2)
3.3	$m(x) = -4\,f(x) + 1$ $m(x) = -4\,(\cos x) + 1$ $\therefore m(x) = -4\cos x + 1$ $\therefore y \in [-3; 5]$ **OR/*OF*** $-3 \leq y \leq 5$ **OR/*OF*** Range of *f*:/*Waardeversameling van* f: $y \in [-1; 1]$ OR/*OF* $-1 \leq y \leq 1$ Range of *m*/*Waardeversameling van* m $\therefore y \in [-3; 5]$ OR/*OF* $-3 \leq y \leq 5$	✓ $m(x) = -4\cos x + 1$ ✓ -3 ✓ 5 **OR/*OF*** ✓ range of f/*Waardeversameling van* f ✓ -3 ✓ 5	(3)
			[6]
QUESTION/*VRAAG* 4			
4.1	$\sin\beta = \frac{BD}{x}$ $\therefore$ BD $= x\sin\beta$ $\tan\theta = \frac{BD}{AB}$ $\therefore AB = \frac{BD}{\tan\theta}$ $\therefore AB = \frac{x\sin\beta}{\tan\theta}$	✓ correct trig ratio/ *korrekte trig verhouding* ✓ BD $= x\sin\beta$ ✓ correct trig ratio/ *korrekte trig verhouding* ✓ $AB = \frac{BD}{\tan\theta}$	(4)
4.2	$AB = \frac{12 \times \sin 40}{\tan 52}$ $AB = 6{,}02\ldots.$ $AB = 6\ m$	✓ Substitution/Vervanging ✓ Answer/Antwoord	(2)
			[6]

Downloaded from Stanmorephysics.com

QUESTION/*VRAAG* 5				
5.1		parallel to the third side and equal to half the length of the third side *ewewydig aan die derde sy en gelyk aan die helfte van die lengte van die derde sy*	✓ S ✓ S	(2)
5.2	5.2.1	BO = OD AO = OC diagonals of rhombus bisect at 90°/ *hoeklyne van ruit halveer by 90°* $BC^2 = CO^2 + OB^2$ Pythagoras $= 15^2 + 8^2$ = 289 BC = 17	✓ S/R ✓ S ✓ Substitution/*Vervanging* ✓ Answer/*Antwoord*	(4)
	5.2.2	OF = $\frac{1}{2}$CD midpoint theorem/*middelpunt stelling* CD = BC *sides of a rhombus are equal/ sye van ruit is gelyk* OF = $\frac{17}{2}$	✓ S/R ✓ S ✓ Answer/*Antwoord*	(3)
	5.2.3	$\hat{B}_1 + \hat{B}_2 = O\hat{F}C$ *corresponding angles;* AB ∥ OF *ooreenkomstige hoeke* = 64° $\hat{B}_1 = \hat{B}_2$ diagonals of a rhombus bisect angles/ *hoeklyne van ruit halveer hoeke* $\hat{B}_1 = 32°$	✓ S/R ✓ S ✓ R	(3)
5.3	Area of ABCD = $\frac{1}{2} \times BO \times OA \times 4$ = $\frac{1}{2} \times 15 \times 8 \times 4$ = 240 cm^2		✓ Method/*Metode* ✓ Answer/*Antwoord*	(2)
				[14]

		TOTAL/*TOTAAL*:	**50**