



education

Department:
Education
North West Provincial Government
REPUBLIC OF SOUTH AFRICA

PROVINCIAL ASSESSMENT

GRADE 10

MATHEMATICS P2

JUNE 2024

MARKS: 75

TIME: $1\frac{1}{2}$ hours

This question paper consists of 8 pages and an answer book of 13 pages.



INSTRUCTIONS AND INFORMATION

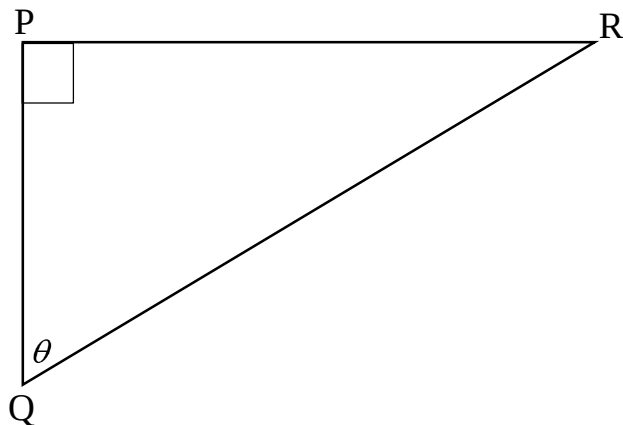
Read the following instructions carefully before answering the questions.

1. This question paper consists of SEVEN questions.
2. Answer ALL the questions in the SPECIAL ANSWER BOOK provided.
3. Clearly show ALL calculations, diagrams, graphs, etc. which you have used in determining your 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 correct to TWO decimal places, unless stated otherwise.
7. Diagrams are NOT necessarily drawn to scale.
8. Write neatly and legibly.



QUESTION 1

- 1.1 In $\triangle PQR$, $\hat{P} = 90^\circ$ and $\hat{Q} = \theta$



Find the ratios

1.1.1 $\tan \theta$ (1)

1.1.2 $\sec(90^\circ - \theta)$ (2)

- 1.2 If $x = 25^\circ$ and $y = 40^\circ$. Use a calculator to determine :

1.2.1 $\sin(y - x)$ (2)

1.2.2 $\frac{\cos x}{2} - \cot \frac{x}{2}$ (2)

- 1.3 If $5 \tan \alpha = 12$ and $0^\circ \leq \alpha \leq 90^\circ$, use the sketch to determine :

1.3.1 $\cos \alpha$ (2)

1.3.2 $(\sin \alpha + \cos \alpha)^2$ (2)

[11]

QUESTION 2

2.1 Simplify without using a calculator:

$$\cos 60^\circ + \tan^2(45^\circ) - \sin 0^\circ \quad (4)$$

2.2 In each of the following equations, solve for x , where $0^\circ \leq x \leq 90^\circ$ correct your answer to two decimal places.

$$2.2.1 \quad \frac{\sin x}{0,2} - 2 = 1,24 \quad (3)$$

$$2.2.2 \quad \tan \frac{x}{2} - \frac{1}{\sqrt{3}} = 0 \quad (3)$$

[10]

QUESTION 3

Given $f(x) = \tan x$ and $g(x) = 2 \cos x$ for $0^\circ \leq x \leq 360^\circ$.

3.1 Sketch, on the grid provided, the graph of f and g for $0^\circ \leq x \leq 360^\circ$. (8)

3.2 Write the following :

3.2.1 Period of f . (1)

3.2.2 Amplitude of g . (1)

3.3 Use your graph to determine the values of x for which :

$$3.3.1 \quad g(x) - f(x) = 2. \quad (2)$$

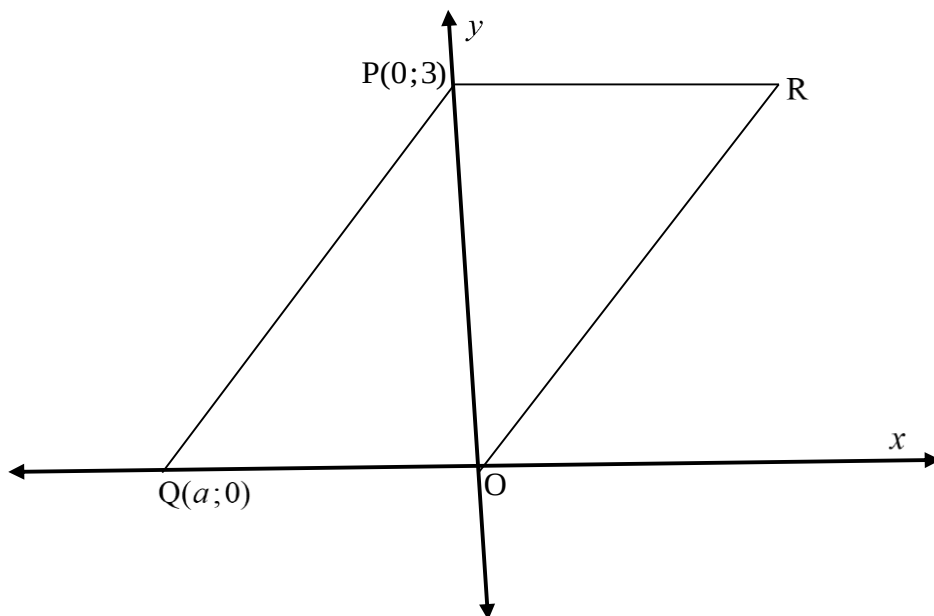
$$3.3.2 \quad g(x) = -2. \quad (1)$$

[13]



QUESTION 4

In the diagram below, OR is drawn parallel to the straight line through Q(a;3) and P(0;3) such that $PR \parallel QO$. The length of PQ = 5



4.1 Find the value of a . (2)

4.2 Determine the equation of PQ. (4)

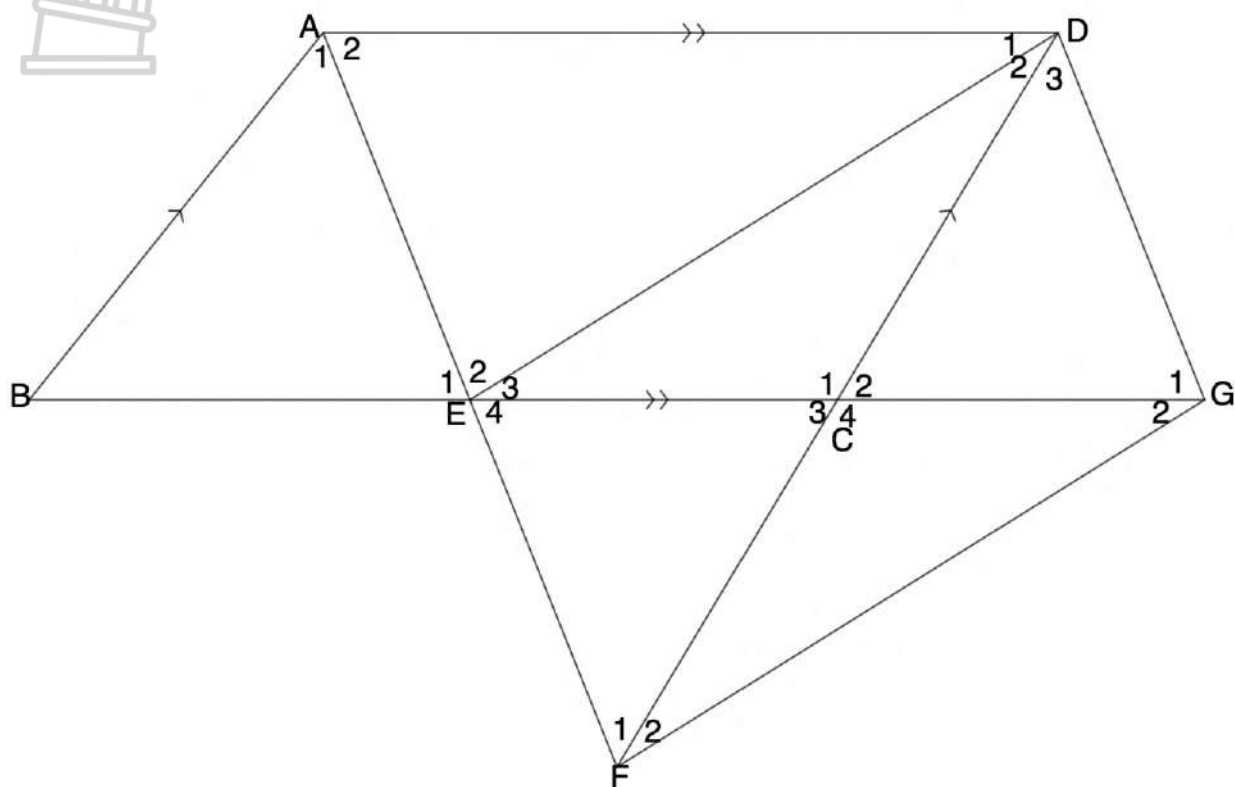
4.3 Determine the midpoint of OP. (2)

4.4 If $PQ \parallel RO$. Calculate the coordinates of R. (2)

[10]

QUESTION 5

In the diagram below, $AB \parallel DF$, $AB = EC$ and AE bisect $\hat{B}AD$.



5.1 Prove that $\triangle DCE$ is an isosceles triangle. (3)

5.2 If $\hat{A}_1 = x$, determine with reasons:

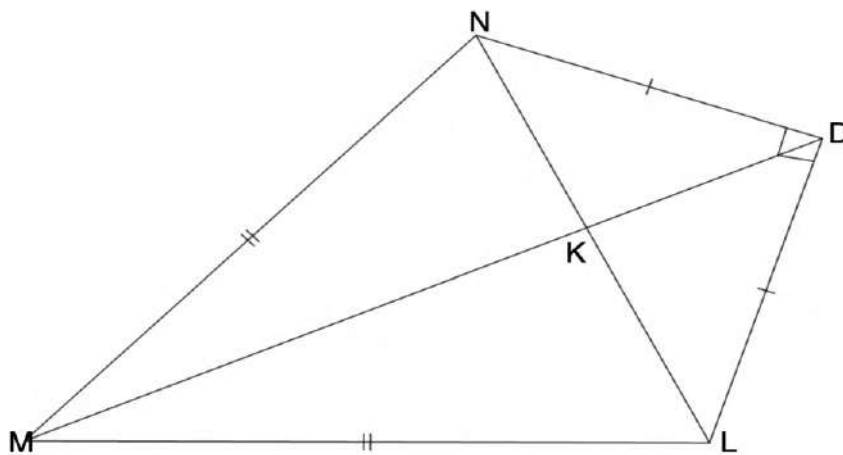
5.2.1 Four other angles equal to x . (8)

5.2.2 $\hat{B}$ in terms of x . (2)

[13]

QUESTION 6

In the diagram below, LMND is a kite with $DM = 45\sqrt{2}$ units, $\hat{LDN} = 90^\circ$ and $DN = 30$ units. The diagonals meet at K.



6.1 Determine the size of $\hat{NDK}$ (2)

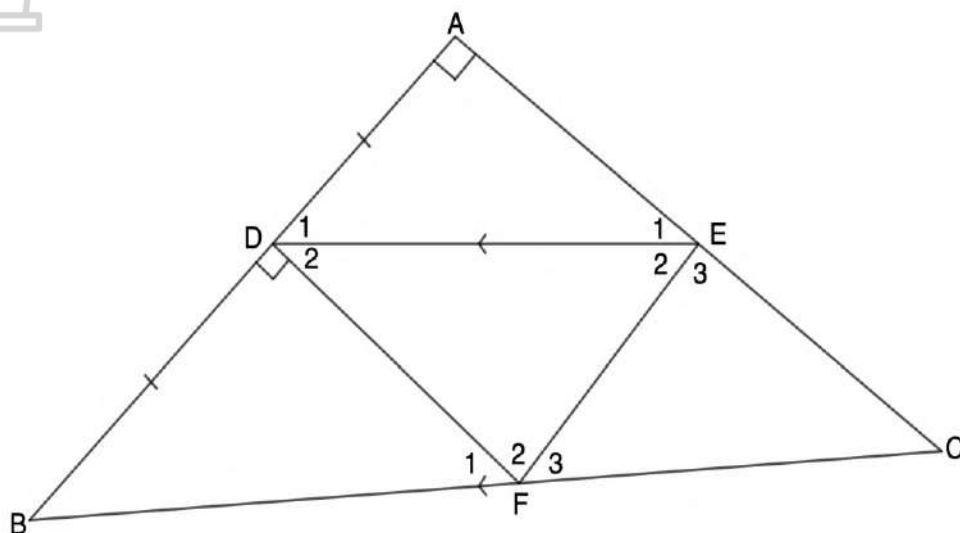
6.2 Show that $NK = \frac{30}{\sqrt{2}}$ (2)

6.3 Show that $NM = 15\sqrt{10}$ (3)

[7]

QUESTION 7

In the diagram below, $\triangle ABC$ is right angled at $\hat{A}$. D is the midpoint AB ; $DE \parallel BC$ and $FD \perp AB$.



Prove that :

7.1 $AE = EC$ (3)

7.2 $DF \parallel AC$ (2)

7.3 $BF = FC$ (2)

7.3 If $\hat{E}_1 = 30^\circ$ and $AB \parallel EF$
Determine what type of a quadrilateral will ADFE be. (Show all your working) (4)

[11]

TOTAL: 75



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LEARNER NAMES	
CLASS	

MATHEMATICS P2

GRADE 10

JUNE 2024

SPECIAL ANSWER BOOK

QUESTION	MARKS			INITIALS	MODERATION			INITIALS
1								
2								
3								
4								
5								
6								
7								
TOTAL								

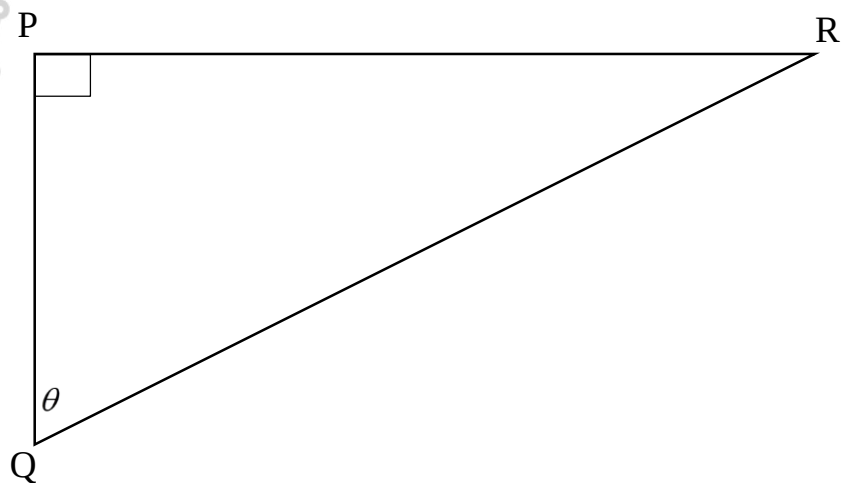
This answer book consists of 13 pages

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
6. work that must not be marked.



Question 1



	Solution	MARKS
1.1.1		(1)
1.1.2		(2)
1.2.1		(2)
1.2.2		(2)

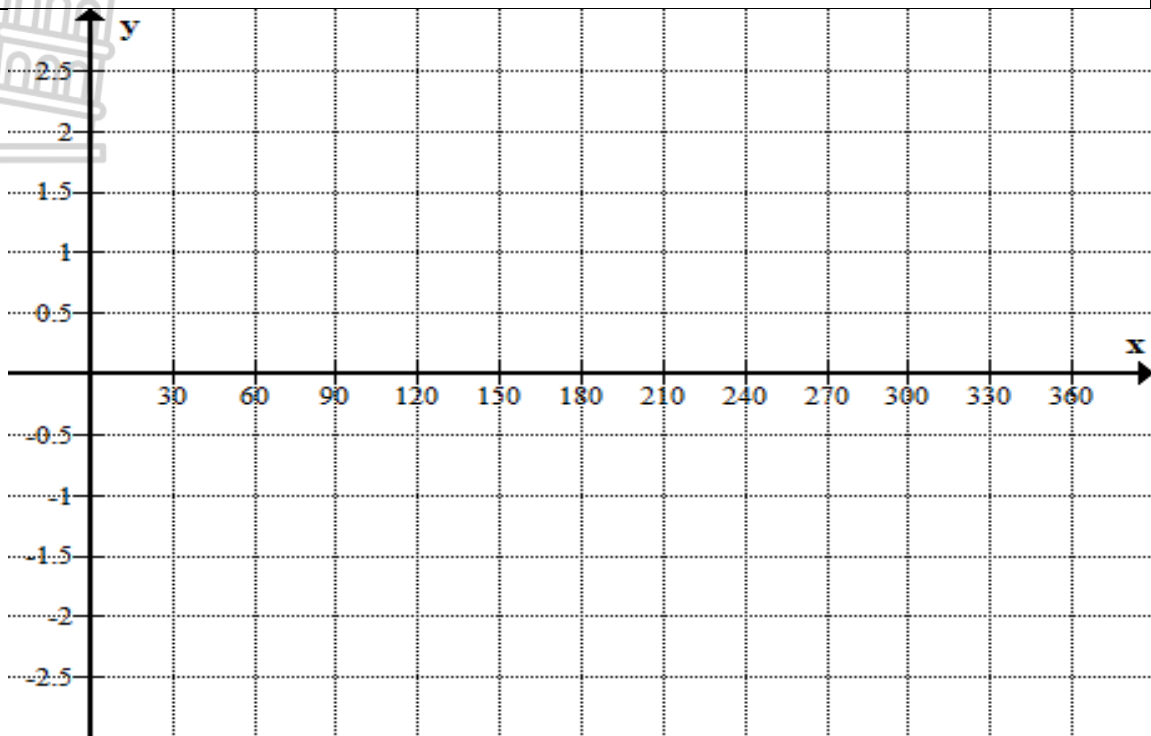


1.3.1		(2)
1.3.2		(2)
		[11]

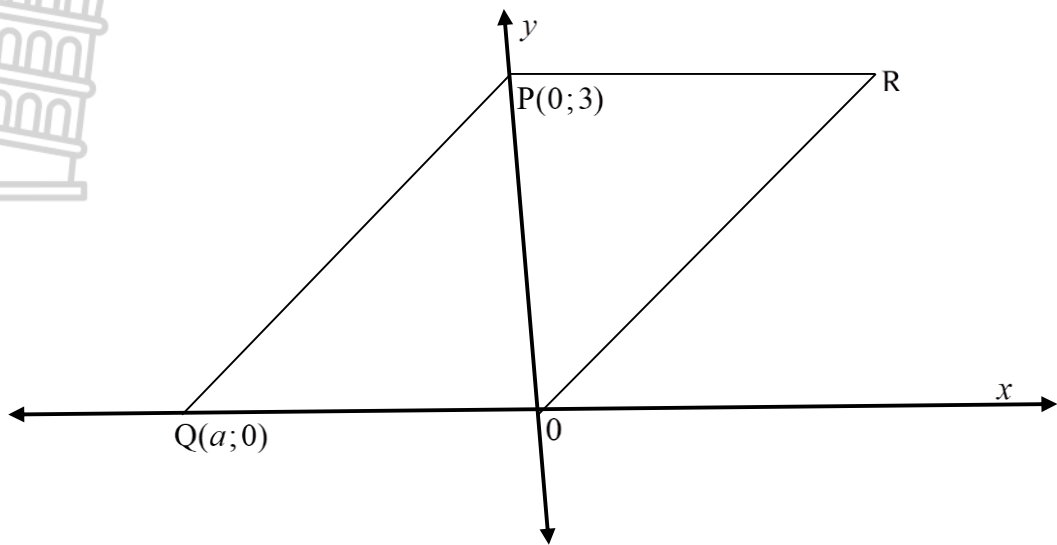
QUESTION 2

	Solution	MARKS
2.1		(4)
2.2.1		(3)
2.2.2		(3)
		[10]

QUESTION 3

	Solution	MARKS
		
3.2.1		(1)
3.2.2		(1)
3.3.1		(2)
3.3.2		(1)
		[13]

QUESTION 4

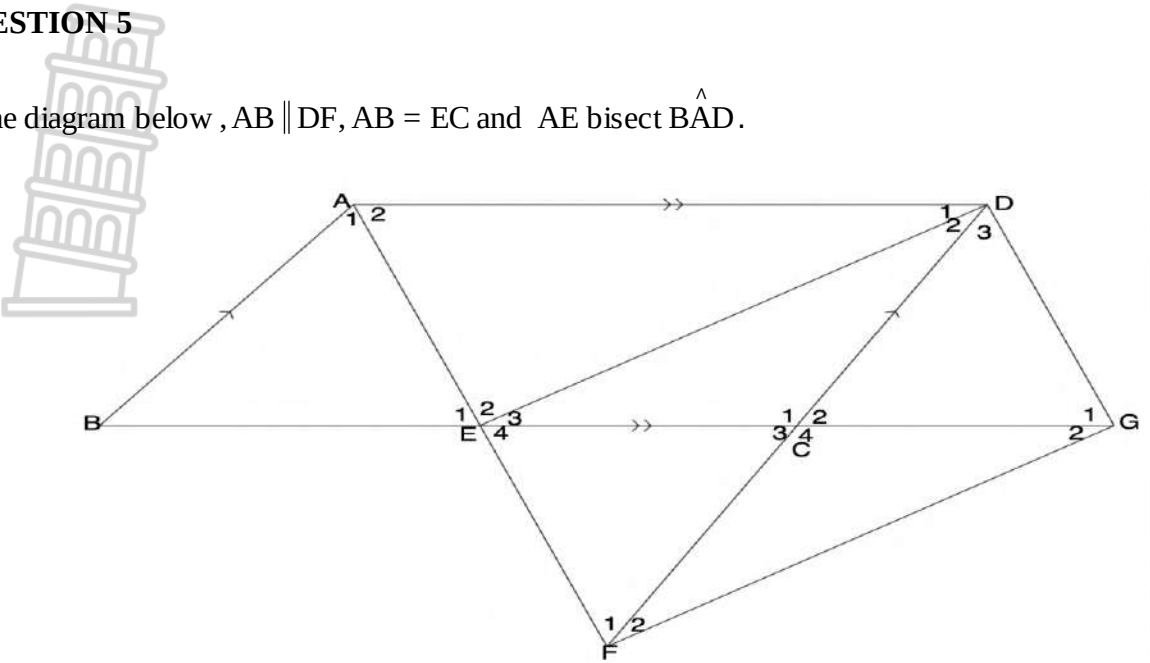


	Solution	MARKS
4.1		(2)
4.2		(4)
4.3		(2)
4.4		(2)
		[10]



QUESTION 5

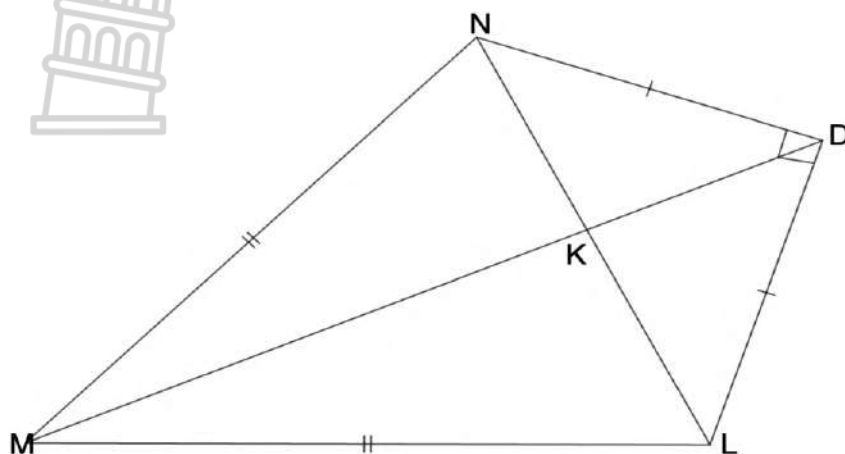
In the diagram below, $AB \parallel DF$, $AB = EC$ and AE bisects $\angle BAD$.



	Solution	MARKS
5.1		(3)
5.2.1		(8)
5.2.2		(2)
		[13]

QUESTION 6

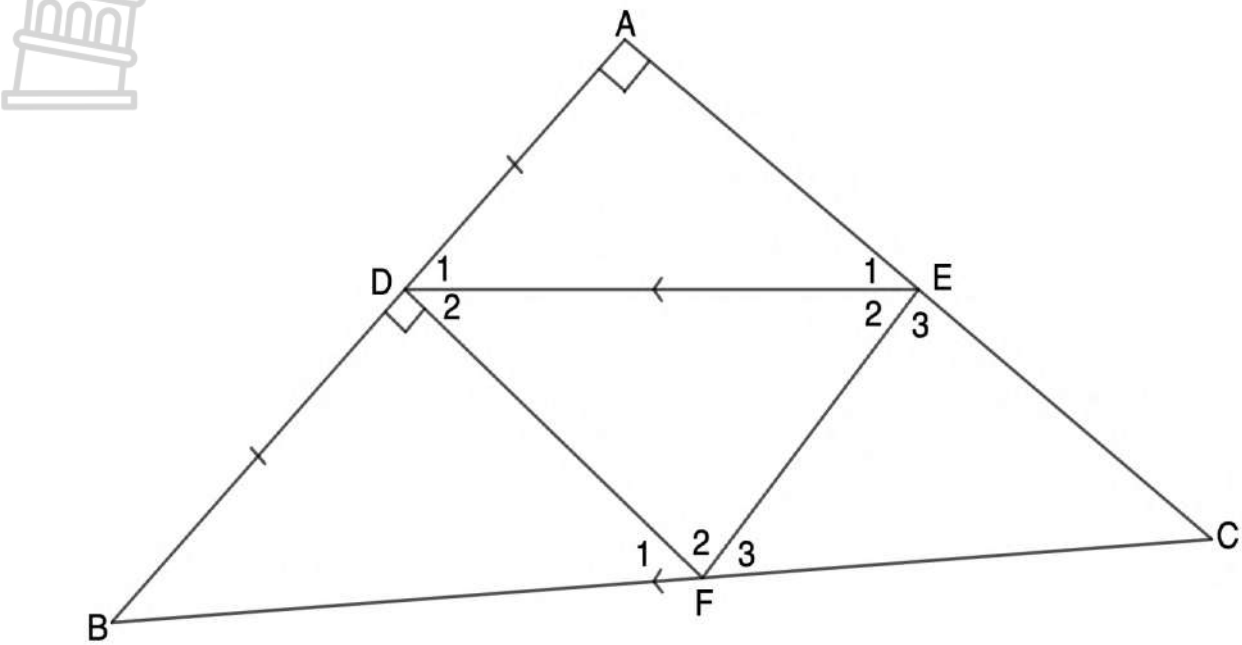
In the diagram below, LMND is a kite with $DM = 45\sqrt{2}$ units, $\angle D = 90^\circ$ and $DN = 30$ units.
The diagonals meet at K.



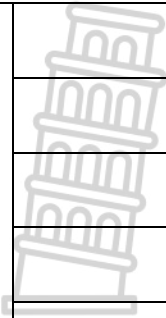
	Solution	MARKS
6.1		(3)
6.2		(2)
6.3		(3)
		[7]

QUESTION 7

In the diagram below, $\triangle ABC$ is right angled at $\hat{A}$. D is the midpoint AB ; $DE \parallel BC$ and $FD \perp AB$.



	Solution	MARKS
7.1		(3)
7.2		(2)
7.3		(2)
7.4		

		
		(4)
		[11]

ADDITIONAL SPACE

	Solution	MARKS

ADDITIONAL SPACE

	Solution	MARKS

	Solution	MARKS
\		

TOTAL: 75



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MATHEMATICS P2
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MARKING GUIDELINES

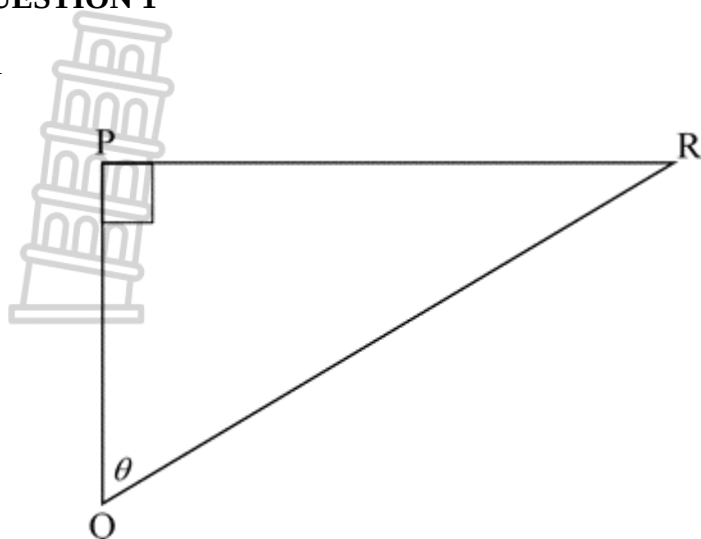
MARKS: 75



These marking guidelines consist of 8 pages.

QUESTION 1

1.1



1.1.1	$\frac{PR}{PQ}$	✓ answer (1)
1.1.2	$\sec(90^\circ - \theta) = \frac{QR}{PR}$	✓✓ answer (2)
1.2.1	$\sin(40^\circ - 25^\circ)$ $= \sin(15^\circ)$ $= 0,26$	✓ sin 15 ✓ answer (2)
1.2.2	$\frac{\cos 25^\circ}{2} - \cot \frac{25^\circ}{2}$ $= \frac{\cos 25^\circ}{2} - \frac{1}{\tan(12,5^\circ)}$ $= -4,06$	✓ correct substitution ✓ answer (2)
1.3		
1.3.1	$r^2 = x^2 + y^2$ – Theorem of pythagoras $r^2 = 5^2 + 12^2$ $r = 13$ $\cos \theta = \frac{5}{13}$	✓ $r = 13$ ✓ $\cos \theta = \frac{5}{13}$ (2)

1.3.2	$(\cos \theta + \sin \theta)^2$ $= \left(\frac{12}{13} + \frac{5}{13} \right)^2$ $= \left(\frac{17}{13} \right)^2$ $= \frac{289}{169}$	✓ substitution ✓ answer
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(2)

[11]

QUESTION 2

2.1	$\cos 60^\circ + \tan^2(45^\circ) - \sin 0^\circ$ $= \frac{1}{2} + \left(\frac{1}{\sqrt{2}} \right)^2 - 0$ $= \frac{1}{2} + \frac{1}{2}$ $= 1$	✓ $\frac{1}{2}$ ✓ $\left(\frac{1}{\sqrt{2}} \right)^2$ ✓ 0 ✓ 1
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(4)

2.2.1	$\frac{\sin x}{0,2} - 2 = 1,24$ $\frac{\sin x}{0,2} = 3,24$ $\sin x = 3,24 \times 0,2$ $\sin x = 0,648$ $x = \sin^{-1}(0,648)$ $x = 40,39^\circ$	✓ 3,24 ✓ $\sin x = 0,648$ ✓ answer
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(3)

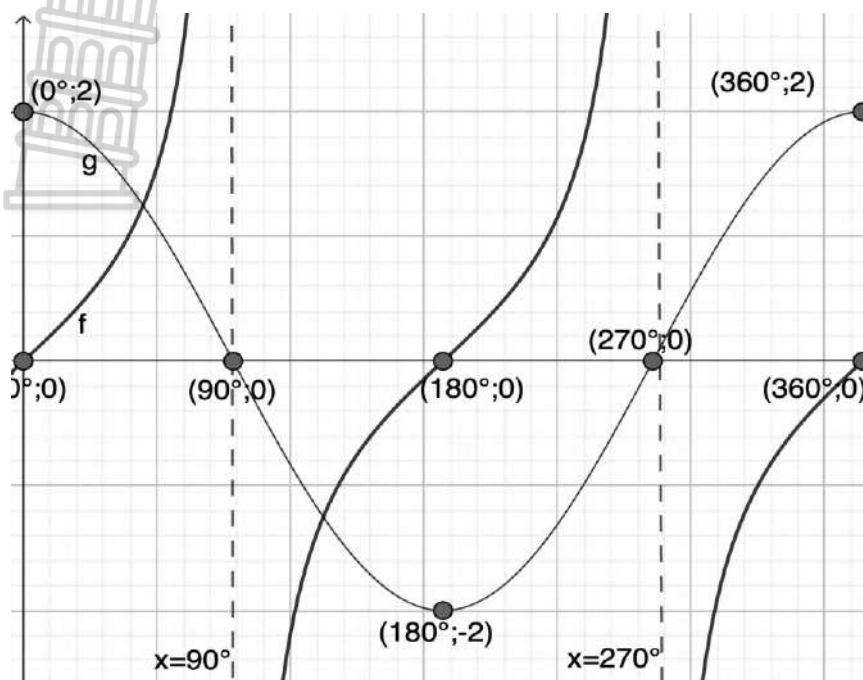
2.2.2	$\tan \frac{x}{2} - \frac{1}{\sqrt{3}} = 0$ $\tan \frac{x}{2} = \frac{1}{\sqrt{3}}$ $\frac{x}{2} = 30^\circ$ $x = 60^\circ$	✓ $\tan \frac{x}{2} = \frac{1}{\sqrt{3}}$ ✓ $\frac{x}{2} = 30^\circ$ ✓ answer
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(3)

[10]

QUESTION 3

3.1 $f(x) = \tan x$ and $g(x) = 2\cos x$ for $0^\circ \leq x \leq 360^\circ$.



f graph

- ✓ y-intercept
- ✓ x-intercept
- ✓ Asymptotes
- ✓ Shape

g graph

- ✓ y-intercept
- ✓ x-intercept
- ✓ T.P
- ✓ Shape

(8)

3.2.1 Period = 180°

✓ answer

(1)

3.2.2 Amplitude = 2

✓ answer

(1)

3.3.1 $x = 0^\circ$
 $x = 360^\circ$

- ✓ $x = 0^\circ$
- ✓ $x = 360^\circ$

(2)

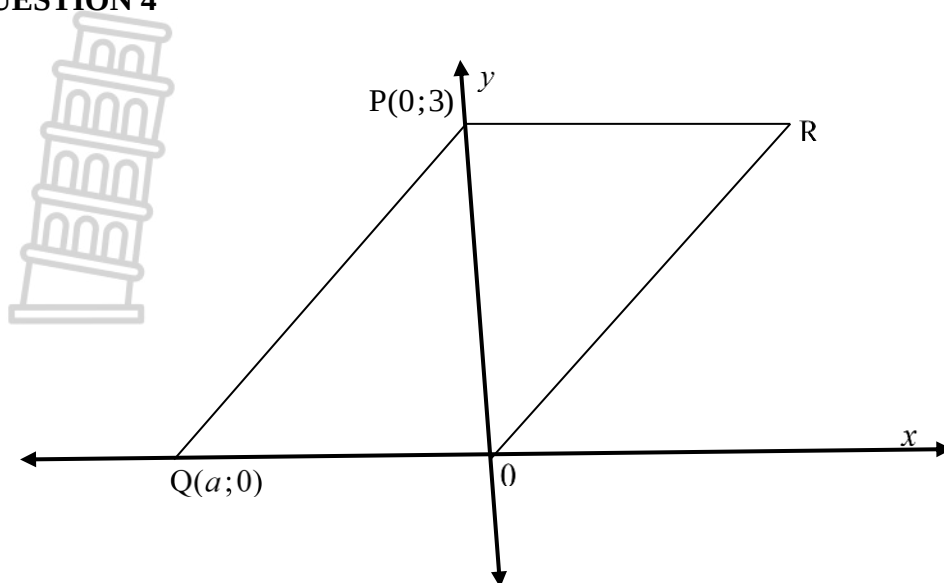
3.3.2 $x = 180^\circ$

✓ answer

(1)

[13]

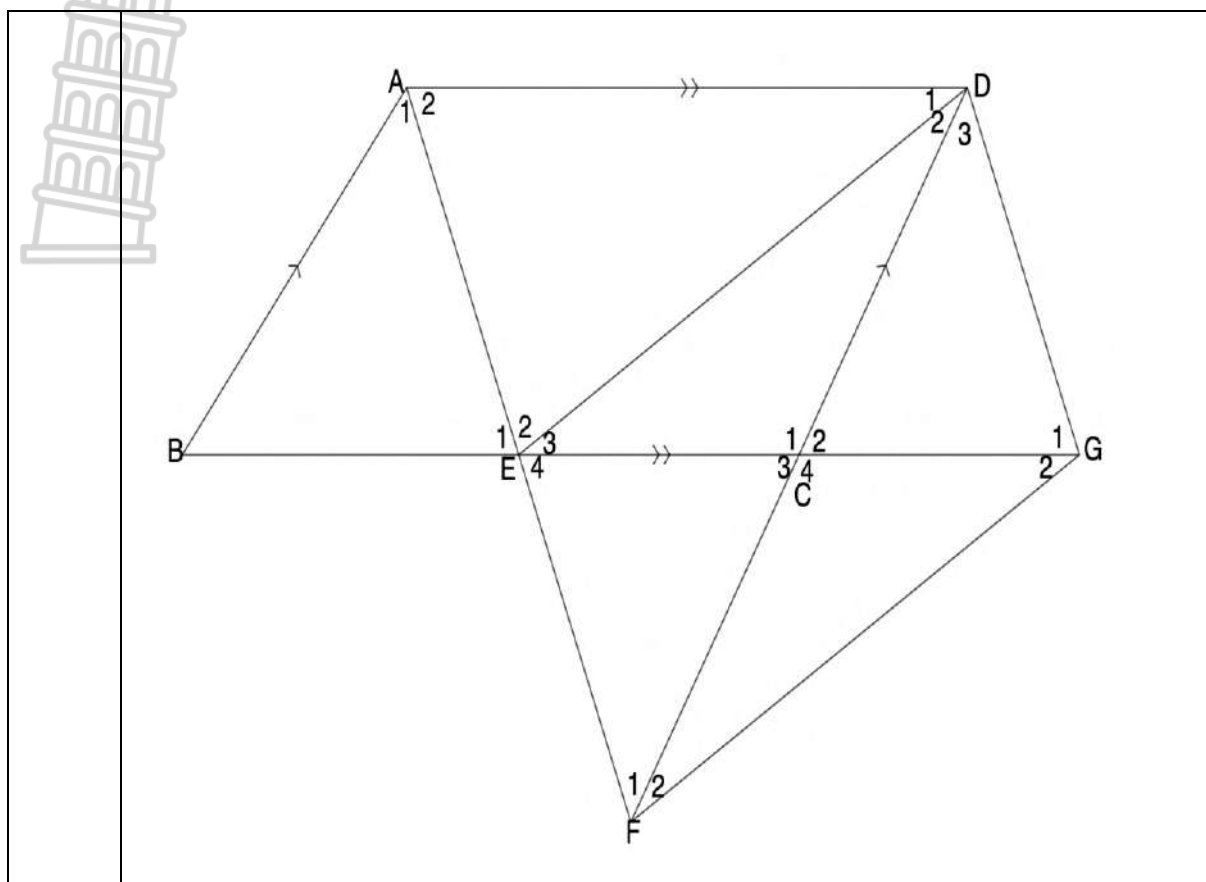
QUESTION 4



4.1	$OQ^2 + OP^2 = QR^2$ [Pyth] $a^2 + 3^2 = 5^2$ $a^2 = 16$ $a = \pm 4$ $\therefore a = -4$	✓ substitution ✓ answer (2)
4.2	$c = 3$ $m = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{3 - 0}{0 - (-4)}$ $= \frac{3}{4}$ $y = mx + c$ $\therefore y = \frac{3}{4}x + 3$	✓ y – intercept/ $c = 3$ ✓ substitution ✓ $m = \frac{3}{4}$ ✓ answer (4)
4.3	$M \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$ $M \left(\frac{0 + 0}{2}, \frac{0 + 3}{2} \right)$ $M \left(0; \frac{3}{2} \right)$	✓ substitution for x and y ✓ answer (2)
4.4	R(4; 3)	✓ 4 ✓ 3 (2)

[10]

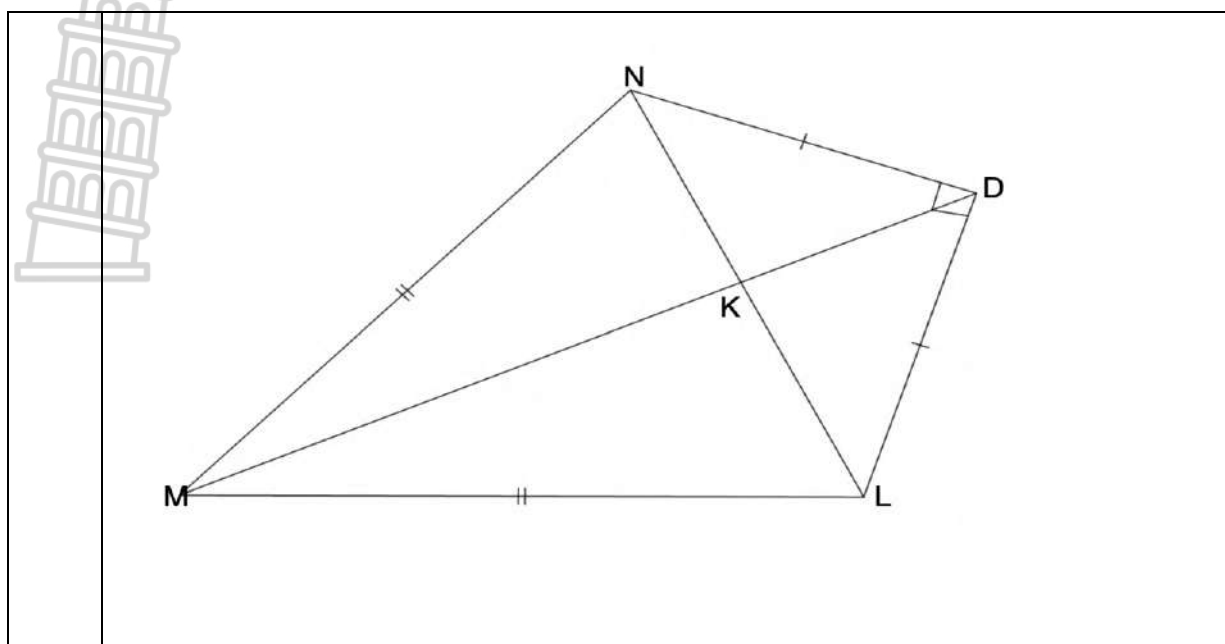
QUESTION 5



5.1	$AB = EC$ [given] $AB = BC$ [opp sides of a parm ABCD] $\triangle DCE$ is an isocetes [2 sides = in $\triangle$]	$\checkmark$ S/R $\checkmark$ S/R $\checkmark$ R	(3)
5.2.1	$A_2 = x$ [AE bisects BAD] $E_1 = x$ [alt $\angle$'s $AD \parallel BG$] $E_4 = x$ [corr $\angle$'s $AB \parallel FD$] $\hat{A}FD = x$ [alt $\angle$'s $AB \parallel FD$]	$\checkmark$ S $\checkmark$ R $\checkmark$ S $\checkmark$ R $\checkmark$ S $\checkmark$ R $\checkmark$ S $\checkmark$ R	(8)
5.2.2	$\hat{B} = 180^\circ - 2x$ [sum of $\angle$'s of a $\triangle$]	$\checkmark$ S $\checkmark$ R	(2)

[13]

QUESTION 6



6.1	$\hat{N}DK = 45^\circ$ [MD bisects $\hat{N}DL$] OR $\hat{NKD} = 90^\circ$ [diagonals of kite] $\hat{LND} = 45^\circ$ [$\angle$'s opp = sides; $ND = LD$] $\therefore \hat{NDK} = 45^\circ$ [Sum of $\angle$'s of a Δ NDK]	✓S ✓R ✓method ✓answer (2)
6.2	$\sin 45^\circ = \frac{NK}{ND}$ $\sin 45^\circ = \frac{NK}{30}$ $NK = 30 \sin 45^\circ$ $NK = \frac{30}{\sqrt{2}}$	✓ $\sin 45^\circ = \frac{NK}{30}$ ✓ $NK = 30 \sin 45^\circ$ (2)
6.3	$MK = DM - DK$ $MK = 45\sqrt{2} - 15\sqrt{2} = 30\sqrt{2}$ $NM^2 = NK^2 + MK^2$ $NM^2 = (15\sqrt{2})^2 + (30\sqrt{2})^2$ $NM = 15\sqrt{10}$	✓ $MK = DM - DK$ ✓ $MK = 30\sqrt{2}$ ✓ substitution (3)

[7]

QUESTION 7

7.1	$DE \parallel BC$ - given $AD = DB$ [given] $AE = EC$ [Line through midpoint $\parallel$ to 2nd side]	✓S ✓SR ✓conclusion (3)
7.2	$\hat{BDF} = \hat{DAE}$ given/corr $\angle$'s $DF \parallel AC$	✓S ✓R (2)
7.3	$DF \parallel AC$ and $AD = BD$ [proved above] $\therefore BF = FC$ [Line through midpoint $\parallel$ to 2nd side]	✓S ✓R (2)
7.4	$\hat{D} = 60^\circ$ [$\angle$'s of Δ] $AD \neq AE$ [ADE will not be an isosceles Δ] $\therefore ADFE$ is a rectangle [opp sides = and $\parallel$, angles = 90°]	✓S ✓S ✓R ✓R (4)

[11]

TOTAL: 75