



**education**

Department:  
Education  
PROVINCE OF KWAZULU-NATAL

**NATIONAL  
SENIOR CERTIFICATE**

**GRADE 10**

**MATHEMATICS P2**

**COMMON TEST**

**JUNE 2024**

**MARKS: 50**

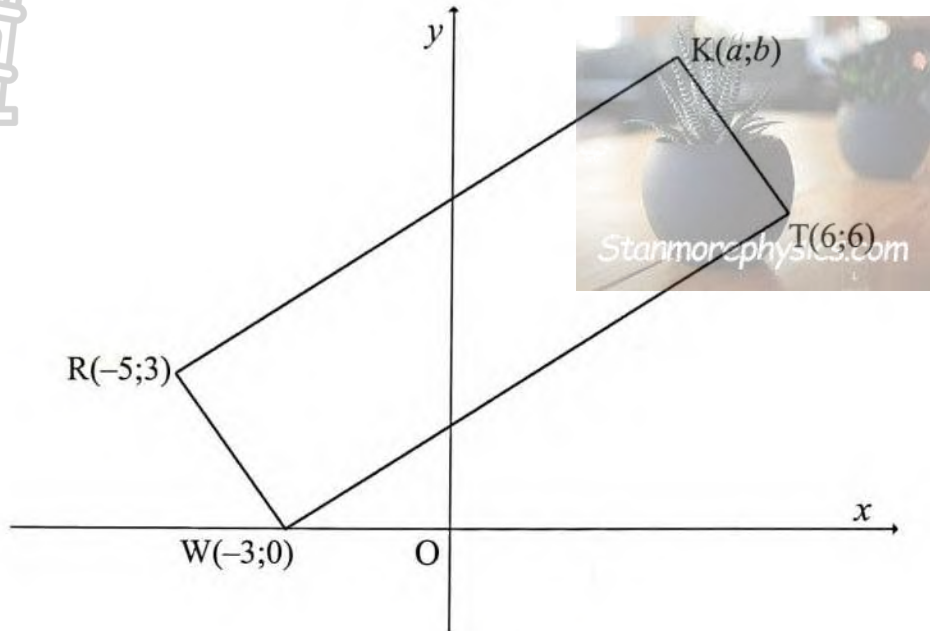
**TIME: 1 Hour**



**This question paper consists of 6 pages.**

## QUESTION 1

In the diagram  $R(-5;3)$ ,  $W(-3;0)$ ,  $T(6;6)$  and  $K(a;b)$  are the vertices of quadrilateral  $RWTK$ .

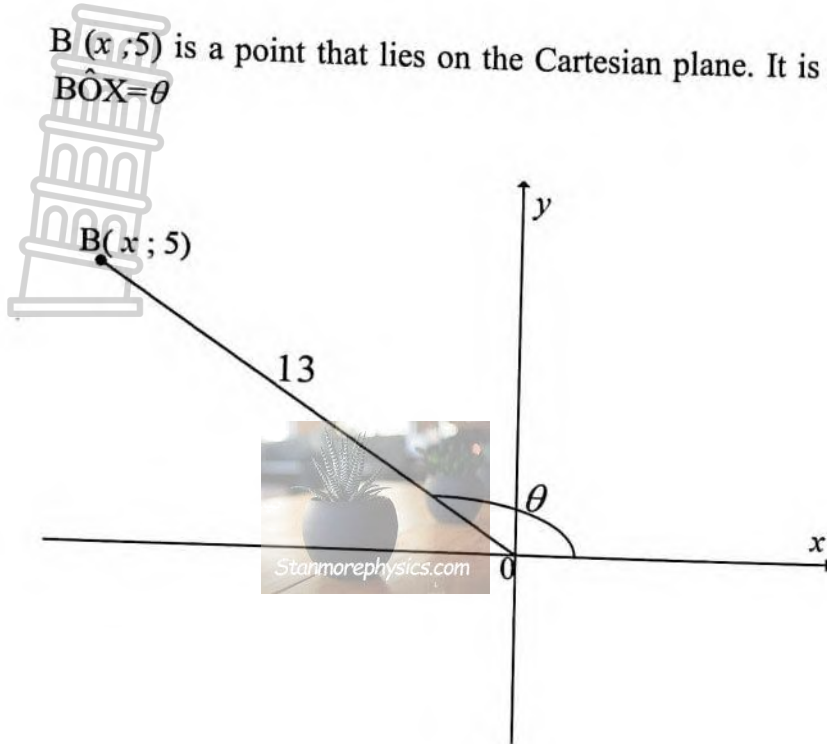


- 1.1 Determine the coordinates of M the midpoint of line RT. (3)
- 1.2 Calculate the gradient of the line WT. (3)
- 1.3 Prove that RW is perpendicular to WT. (3)
- 1.4 If  $RWTK$  is a parallelogram, determine the values of  $a$  and  $b$ . (4)

**[13]**

QUESTION 2

2.1 B(x;5) is a point that lies on the Cartesian plane. It is given that  $OB=13$  units and  $\hat{BOX}=\theta$



Using the diagram and **without the use of a calculator**, determine:

2.1.1 the value of  $x$  (2)

2.1.2  $\cos \theta$  (1)

2.1.3  $\frac{12 \sin \theta}{\cos \theta}$  (2)

2.2 Given that  $x = 20^\circ$  and  $y = 21^\circ$ , calculate the value of the following (correct to TWO decimal places).

2.2.1  $\cos 2y$  (1)

2.2.2  $\sin(x + y)$  (2)

2.2.3  $\sec x$  (2)

[10]

QUESTION 3

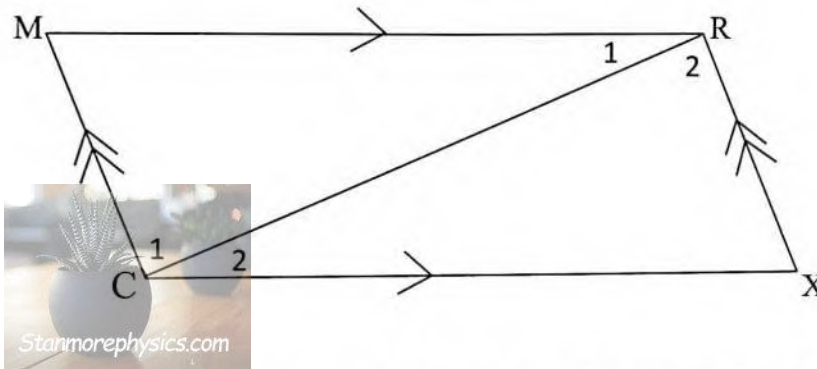
3.1 Without the use of a calculator, calculate the value of:  
 $\sin^2 45^\circ - \cos 60^\circ + \tan 10^\circ \cot 10^\circ$  (4)

3.2 Solve for  $x$ , correct to ONE decimal place where  $0^\circ \leq x \leq 90^\circ$ , if:  $\frac{1}{3 \sin x} = 2$  (3)

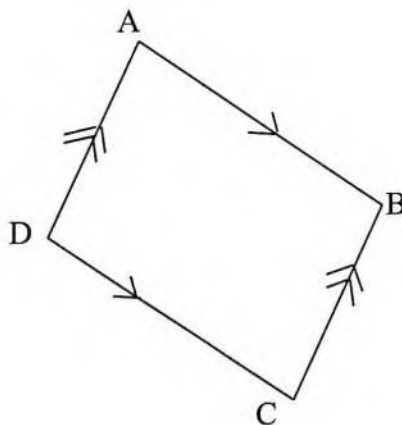
[7]

QUESTION 4

4.1 Use the diagram below to prove that the opposite sides of a parallelogram are equal (4)



4.2 In the diagram below ABCD is a parallelogram with  $\hat{A} = 5x + 5^\circ$  and  $\hat{C} = 8x - 16^\circ$ .



4.2.1 Calculate the value of  $x$ . (3)

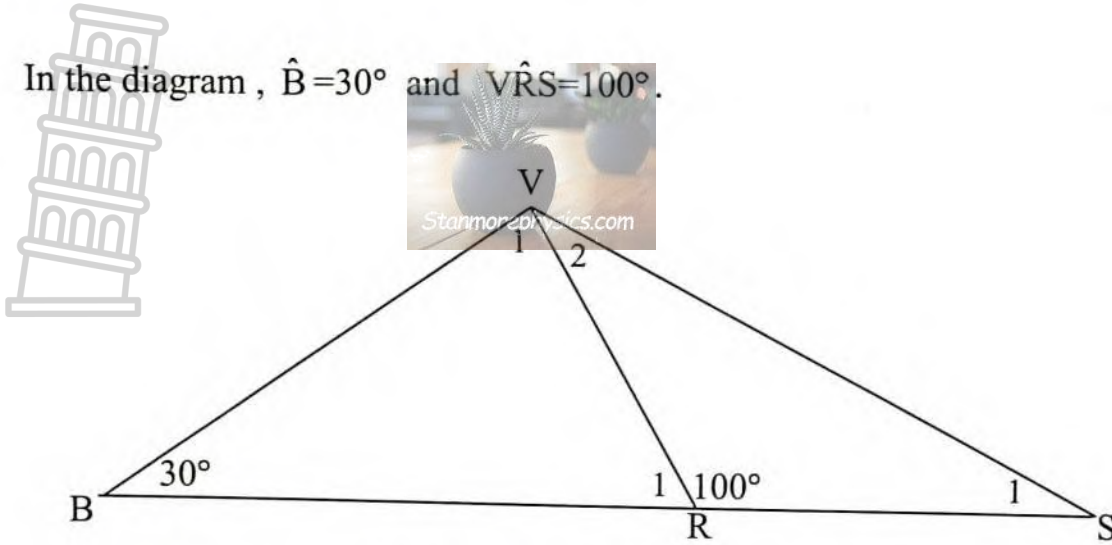
4.2.2 Determine the size of  $\hat{B}$ . (4)

[11]

QUESTION 5

5.1

In the diagram,  $\hat{B} = 30^\circ$  and  $\hat{VRS} = 100^\circ$ .



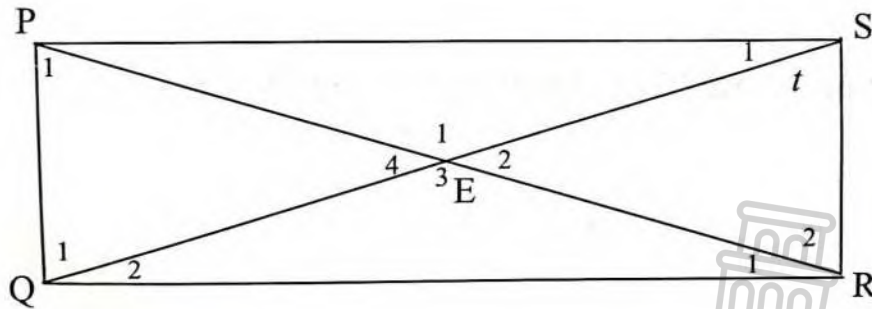
Determine, with reasons the size of the following angles.

5.1.1  $\hat{V}_1$  (2)

5.1.2  $\hat{S}_1$ , if  $VR = RS$ . (2)

5.2

In the diagram below PQRS is a rectangle with E being the point of intersection of the diagonals.  $\hat{QSR} = t$ .



Calculate the size of  $\hat{E}_4$  in terms of  $t$ .

(4)

[9]

TOTAL: [50]

**FINAL**



**education**

Department:  
Education  
PROVINCE OF KWAZULU-NATAL

**MATHEMATICS P2**

**COMMON TEST**

**JUNE 2024**

**MARKING GUIDELINES**

*Stannmorephysics.com*

**NATIONAL  
SENIOR CERTIFICATE**

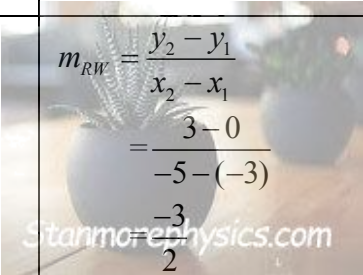
**GRADE 10**

**MARKS: 50**



**These marking guidelines consist of 6 pages.**

**QUESTION 1**

1.1	$M\left(\frac{x_1+x_2}{2}, \frac{y_1+y_2}{2}\right)$ $M\left(\frac{6+(-5)}{2}, \frac{6+3}{2}\right)$ $M\left(\frac{1}{2}, \frac{9}{2}\right)$	<p>✓A Formula ✓A Substitution</p> <p>✓CA Answer</p> <p>(3)</p>
1.2	$m_{WT} = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{6 - 0}{6 - (-3)}$ $= \frac{2}{3}$	<p>✓A Formula ✓A Substitution</p> <p>✓CA Answer</p> <p>(3)</p>
1.3	 $m_{RW} = \frac{y_2 - y_1}{x_2 - x_1}$ $= \frac{3 - 0}{-5 - (-3)}$ $= \frac{-3}{-2}$ $m_{WT} \times m_{RW} = \frac{2}{3} \times \frac{-3}{-2} = -1$ <p>∴ RW is perpendicular to WT</p>	<p>✓A substitution</p> <p>✓A <math>\frac{-3}{2}</math></p> <p>✓A <math>\frac{2}{3} \times \frac{-3}{-2} = -1</math></p> <p>(3)</p>
1.4	$x = \frac{x_1 + x_2}{2} \qquad y = \frac{y_1 + y_2}{2}$ $\frac{1}{2} = \frac{a-3}{2} \qquad \frac{9}{2} = \frac{b+0}{2}$ $a = 4 \qquad b = 9$ <p><b>OR</b> Sliding method</p> $a = 6 - 2 \qquad b = 6 + 3$ $a = 4 \qquad b = 9$	<p>✓CA <math>\frac{1}{2} = \frac{a-3}{2}</math></p> <p>✓CA <math>a = 4</math></p> <p>✓CA <math>\frac{9}{2} = \frac{b+0}{2}</math></p> <p>✓CA <math>b = 9</math></p> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p><b>ANSWER ONLY</b> <b>MAX: 2/4</b></p> </div> <p>(4)</p>
		<b>[13]</b>

**QUESTION 2**

2.1.1	$x^2 + y^2 = r^2$ $x^2 + 5^2 = 13^2$ $x = \pm 12$ $x = -12$	✓ A substitution ✓ CA $x = -12$ (CA provided $x$ is negative) (2)
2.1.2	$\cos \theta$ $= \frac{-12}{13}$	✓ CA answer (1)
2.1.3	$12 \left( \frac{\sin \theta}{\cos \theta} \right)$ $= 12 \left( \frac{5}{\frac{-12}{13}} \right)$ $= -5$	✓ CA substitution ✓ CA answer (2)
2.2.1	$\cos 2(21^\circ)$ $= \cos 42^\circ$ $= 0,74$	NOTE: Penalise only here for rounding ✓ A answer (1)
2.2.2	$\sin(20^\circ + 21^\circ)$ $= \sin 41^\circ$ $= 0,66$	✓ A $(20^\circ + 21^\circ)$ ✓ A answer ANSWER ONLY: FULL MARKS (2)
2.2.3	$\sec(20^\circ)$ $= \frac{1}{\cos(20^\circ)}$ $= 1,06$	✓ A $\frac{1}{\cos 20^\circ}$ ✓ A answer ANSWER ONLY: FULL MARKS (2)
<b>[10]</b>		



**QUESTION 3**

3.1	$\left(\frac{1}{\sqrt{2}}\right)^2 - \frac{1}{2} + \tan 10^\circ \frac{1}{\tan 10^\circ}$ $= \frac{1}{2} - \frac{1}{2} + 1$ $= 1$	✓ A $\left(\frac{1}{\sqrt{2}}\right)^2$ accept $\left(\frac{\sqrt{2}}{2}\right)^2$ ✓ A $\frac{1}{2}$ ✓ A $\frac{1}{\tan 10^\circ}$ ✓ CA answer (4)
3.2	$6 \sin x = 1$ $\sin x = \frac{1}{6}$ $x = 9,6^\circ$ <p style="text-align: center;"><b>NOTE: do not penalise for rounding</b></p>	✓ A $6 \sin x = 1$ ✓ A simplification ✓ CA answer (3)
<b>[7]</b>		

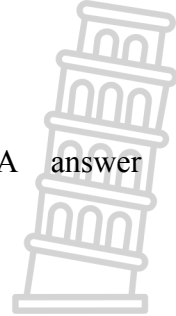
**QUESTION 4**

4.1	In $\triangle MRC$ and $\triangle XCR$ $\hat{R}_1 = \hat{C}_2$ Alt $\angle$ s. MR//CX. $\hat{C}_1 = \hat{R}_2$ Alt $\angle$ s. MC//RX. CR = CR Common side. $\triangle MRC \equiv \triangle XCR$ (AAS) MR=XC MC=XR RC=CR <p style="text-align: center;"><b>NOTE: Penalise ONCE if parallel lines are not stated</b></p>	✓ A S/R ✓ A S/R ✓ A $\triangle MRC \equiv \triangle XCR \dots$ (AAS) ✓ A conclusion (4)
4.2.1	$8x - 16^\circ = 5x + 5^\circ$ opp $\angle$ s of parm $3x = 21^\circ$ $x = 7^\circ$	✓ A S/R ✓ A $3x = 21^\circ$ ✓ CA x-value (CA provided x is positive) (3)
4.2.2	$\hat{D} = \hat{B}$ opp $\angle$ s of parm $\hat{B} + \hat{D} + \hat{A} + \hat{C} = 360^\circ$ Sum $\angle$ s of quad $2\hat{B} + 80^\circ = 360^\circ$ $2\hat{B} = 280^\circ$ $\hat{B} = 140^\circ$	✓ A S/R ✓ A S/R ✓ CA S ✓ CA answer

GRADE 10  
Marking Guideline

	<p><b>OR</b></p> $\hat{C} = 8(7^\circ) - 16^\circ$ $\hat{C} = 40^\circ$ $\hat{B} + \hat{C} = 180^\circ \quad \text{Co-int } \angle \text{s. } AB \parallel DC$ $\hat{B} = 180^\circ - 40^\circ$ $\hat{B} = 140^\circ$	<p>✓CA 40°</p> <p>✓S✓R</p> <p>✓CA answer</p> <p style="text-align: right;">(4)</p>
<b>[11]</b>		

**QUESTION 5**

5.1.1	$\hat{V}_1 + 30^\circ = 100^\circ \quad \text{Ext } \angle \text{ of } \Delta$ $\hat{V}_1 = 70^\circ$ <p><b>OR</b></p> $\hat{R}_1 = 80^\circ \quad \angle \text{s on a str. line}$ $\hat{V}_1 = 70^\circ \quad \text{sum of } \Delta$	<p>✓A S/R</p> <p>✓A answer</p> <p style="text-align: right;">(2)</p>
5.1.2	<div style="background-color: #e0e0e0; padding: 5px; border: 1px solid #ccc;"> <math display="block">\hat{S}_1 = \hat{V}_2 \quad \angle \text{s opp} = \text{sides}</math> <math display="block">\hat{S}_1 + \hat{V}_2 + \hat{VRS} = 180^\circ \quad \text{Sum } \angle \text{s } \Delta</math> <math display="block">2\hat{S}_1 + 100^\circ = 180^\circ</math> <math display="block">2\hat{S}_1 = 80^\circ</math> <math display="block">\hat{S}_1 = 40^\circ</math> </div> <p><b>OR</b></p> $\hat{R}_1 + \hat{VRS} = 180^\circ \quad \angle \text{s on a str line}$ $\hat{R}_1 = 80^\circ$ $\hat{S}_1 = \hat{V}_2 \quad \angle \text{s opp} = \text{sides}$ $\hat{S}_1 + \hat{V}_2 = \hat{R}_1 \quad \text{Ext } \angle \text{ of } \Delta$ $2\hat{S}_1 = 80^\circ$ $\hat{S}_1 = 40^\circ$	<p>✓A S/R</p> <p>✓A S</p> <div style="text-align: center;">  </div> <p>✓A answer</p> <p style="text-align: right;">(3)</p> <p>✓A <math>\hat{R}_1 = 80</math></p> <p>✓A S/R</p> <p>✓A answer</p>

GRADE 10  
Marking Guideline

<p>5.2</p>	<p>ES = ER  <math>\hat{R}_2 = t</math>  <math>\hat{E}_2 + \hat{R}_2 + \hat{E}\hat{S}\hat{R} = 180^\circ</math>  <math>\hat{E}_2 + t + t = 180^\circ</math>  <math>\hat{E}_2 = 180^\circ - 2t</math>  <math>\hat{E}_4 = \hat{E}_2</math>  <math>\hat{E}_4 = 180^\circ - 2t</math></p> <p style="text-align: center;"><b>OR</b></p> <p><math>\hat{Q}_1 = t</math>  <math>\hat{P}_1 = t</math>  <math>\hat{E}_4 + \hat{Q}_1 + \hat{P}_1 = 180^\circ</math>  <math>\hat{E}_4 = 180^\circ - 2t</math></p>	<p>diagonals of rectangle  <math>\angle</math> s opp = sides                  Sum <math>\angle</math> of <math>\Delta</math></p> <p>Vert opp <math>\angle</math> s</p> <p>Alt <math>\angle</math> s PS  QR  <math>\angle</math> s opp = sides                  Sum <math>\angle</math> s <math>\Delta</math></p> <p>✓ A S/R                  ✓ A <math>\hat{E}_2</math>                  ✓ A S/R                  ✓ A answer</p> <p>✓ A S/R                  ✓ A S/R                  ✓ A S                  ✓ A answer</p> <p style="text-align: right;">(4)</p>
<b>[9]</b>		

**TOTAL: 50**

