



GAUTENG PROVINCE
EDUCATION
REPUBLIC OF SOUTH AFRICA

PROVINCIAL EXAMINATION

NOVEMBER 2022

GRADE 9

**MATHEMATICS
(PAPER 2)**

TIME: 1½ hours

MARKS: 75

16 pages

NAME OF LEARNER: _____

GRADE/CLASS: _____

P.T.O.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of 6 questions.
2. Answer ALL the questions on the question paper.
3. A non-programmable calculator may be used unless otherwise stated.
4. Show all calculations, diagrams, and graphs that you have used in determining your answers, clearly. Answers only will not necessarily be awarded full marks.
5. If necessary, round-off your answers to 2 decimal places, unless otherwise stated.
6. Diagrams are not necessarily drawn to scale.
7. Answer question 1 in Section A by circling the letter next to the correct answer.
8. Answer questions 2 to 6 in Section B in the spaces provided.
9. Write neatly and legibly.

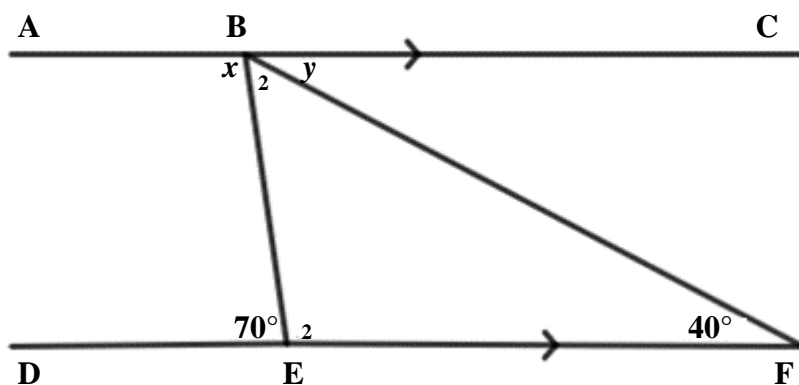
SECTION A

QUESTION 1

Answer the following questions by choosing the correct answer.

Circle the letter next to the correct answer.

1.1 In the diagram below, $ABC \parallel DEF$, $\hat{D}EB = 70^\circ$, $\hat{F} = 40^\circ$, $\hat{A}BE = x^\circ$ and $\hat{C}BF = y^\circ$.

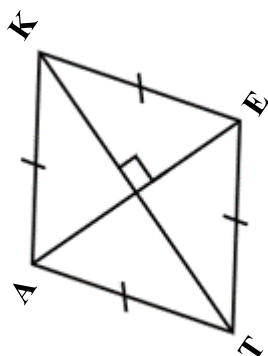


Choose the correct statement for x and y .

- A $x = 90^\circ$ and $y = 70^\circ$
- B $x + y = 180^\circ$
- C $x = 110^\circ$ and $y = 40^\circ$
- D $x = 40^\circ + \hat{E}_2$ and $y = 40^\circ$

(1)

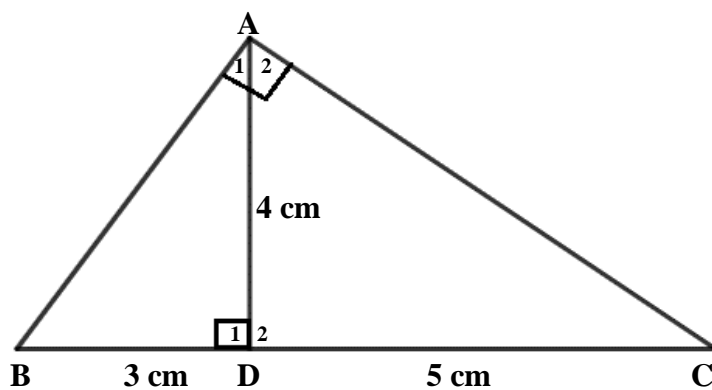
1.2 Quadrilateral KATE is given below.



Which statement below best describes quadrilateral KATE?

- A KATE is a kite because $KA \parallel TE$ and $AT \parallel KE$.
 - B KATE is a rhombus because $KT \perp AE$ and $AK = AT = TE = EK$.
 - C KATE is a square because $AK = AT = TE = EK$.
 - D KATE is a rhombus because $\hat{K} = \hat{T} = \hat{A} = \hat{E}$.
- (1)

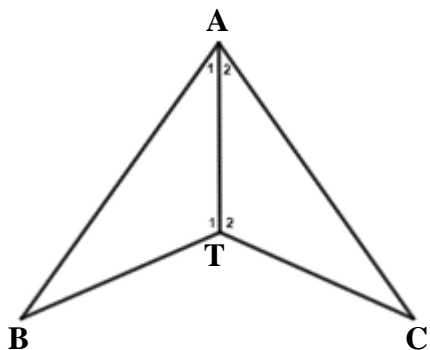
1.3 In $\triangle ABC$, $BA \perp AC$, $AD \perp BC$ and $\hat{A}_1 = \hat{C}$. $BD = 3$ cm, $AD = 4$ cm and $DC = 5$ cm.



The area of $\triangle ADC = \dots$

- A 6 cm^2 .
 - B 10 cm^2 .
 - C 20 cm^2 .
 - D 40 cm^2 .
- (1)

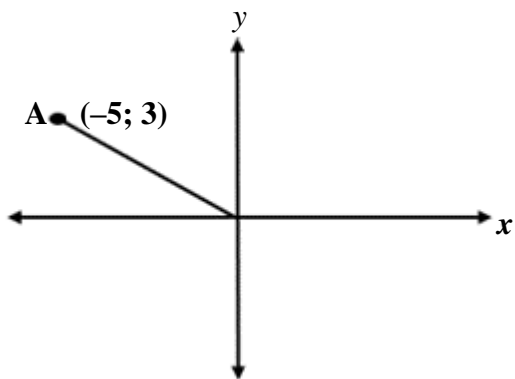
1.4 In the diagram below, $\hat{A}_1 = \hat{A}_2$ and $\hat{B} = \hat{C}$.



Which statement best describes the relationship between ΔABT and ΔACT ?

- A $\Delta ABT \equiv \Delta ACT$ ($\angle\angle\angle$)
 - B $\Delta ABT \parallel \Delta ACT$ ($\angle\angle s$)
 - C $\Delta ABT \equiv \Delta ACT$ ($\angle\angle s$)
 - D $\Delta ABT \parallel \Delta ACT$ ($s\angle s$)
- (1)

1.5 $A(-5; 3)$ is a point on the Cartesian plane.



What are the coordinates of the image A' if A is reflected over the Y-axis?

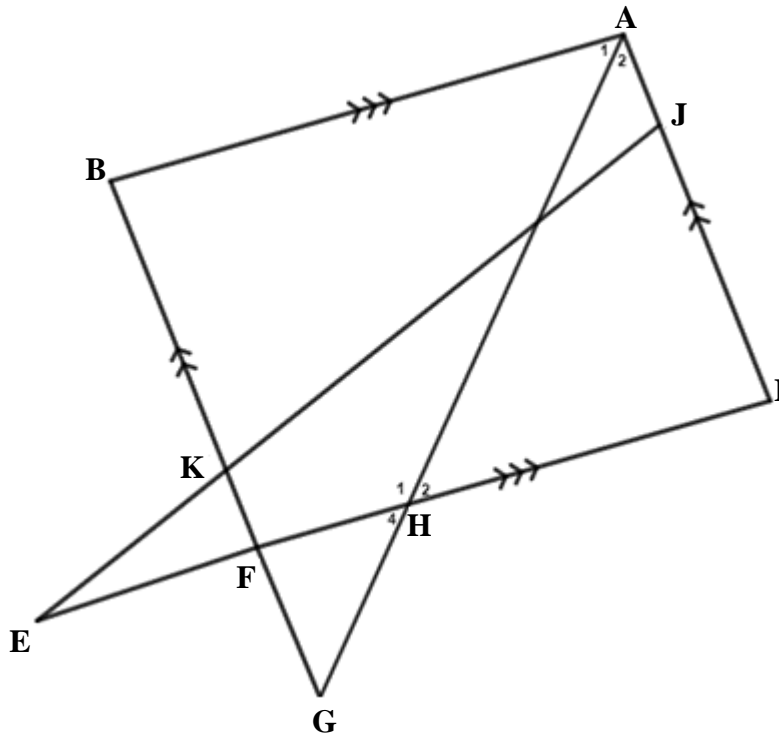
- A $A'(-5; -3)$
 - B $A'(-5; 3)$
 - C $A'(5; -3)$
 - D $A'(5; 3)$
- (1)
[5]

SECTION B

QUESTION 2

Study the diagrams for questions 2.1 to 2.3 and complete the statements or reasons in the tables provided.

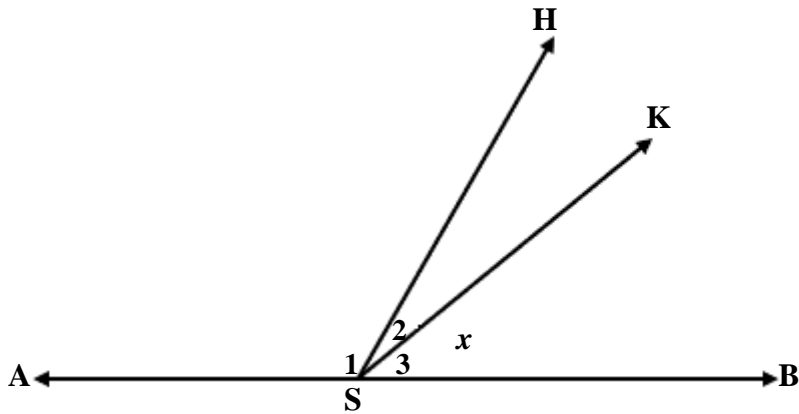
2.1



	STATEMENT	REASON
2.1.1	ABFI is a parallelogram.	_____
2.1.2	$\hat{A} + \hat{I} = 180^\circ$	_____
2.1.3	$\hat{H}_2 = \underline{\hspace{2cm}}$	vert. opp. $\angle s$
2.1.4	$\hat{KFE} = \hat{I}$	_____
2.1.5	$\hat{G} = \hat{A}_2$	_____

(5)

2.2 $\hat{S}_3 = 2\hat{S}_2 = x$, and $\hat{S}_1 = 3\hat{S}_2$

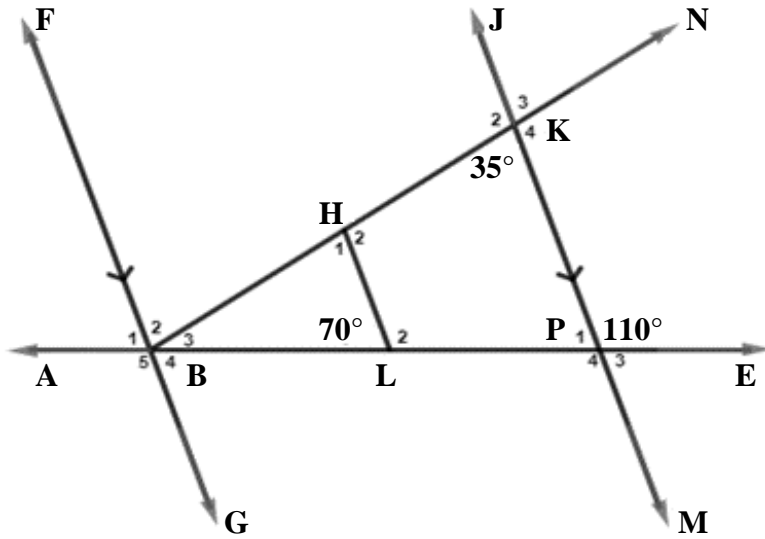


Calculate the value of x .

STATEMENT	REASON
$\hat{S}_1 + \hat{S}_2 + \hat{S}_3 = \underline{\hspace{2cm}}$	$\underline{\hspace{2cm}}$
$\hat{S}_3 = x$ then: $\hat{S}_2 = \underline{\hspace{2cm}} x$ and $\hat{S}_1 = \underline{\hspace{2cm}} x$	Given
$\therefore x + \underline{\hspace{2cm}}x + \underline{\hspace{2cm}}x = 180^\circ$ $x = \underline{\hspace{2cm}}$	Substitute \hat{S}_1, \hat{S}_2 and \hat{S}_3 .

(5)

2.3



2.3.1 Calculate with reasons the size of \hat{B}_3 .

STATEMENT	REASON

(2)

2.3.2 Hence, calculate with reasons the size of \hat{B}_5 .

STATEMENT	REASON

(2)

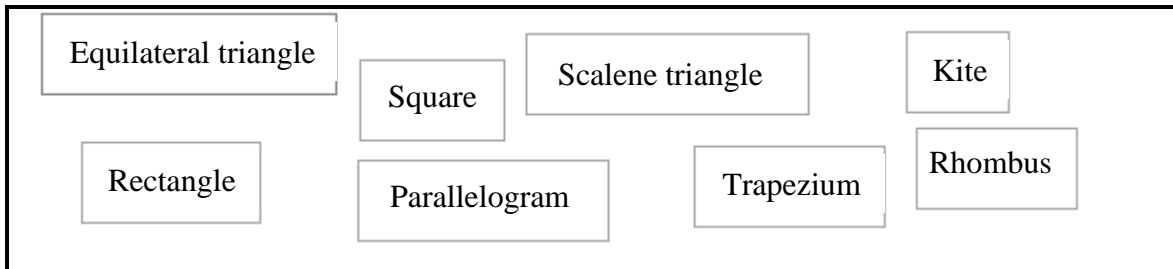
2.3.3 Prove with reasons that $HL \parallel KM$.

STATEMENT	REASON

(3)
[17]

QUESTION 3

3.1 Match the description of the 2D shape in questions 3.1.1 to 3.1.5 with the name of ONE of the 2D shapes given below. Write the answer in the space next to the correct description.



3.1.1 A four-sided shape with one pair of opposite sides parallel

_____ (1)

3.1.2 A four-sided shape with 4 equal sides, equal diagonals that bisect each other perpendicularly and 4 equal angles

_____ (1)

3.1.3 A four-sided shape with perpendicular diagonals and 2 pairs of adjacent sides equal in length

_____ (1)

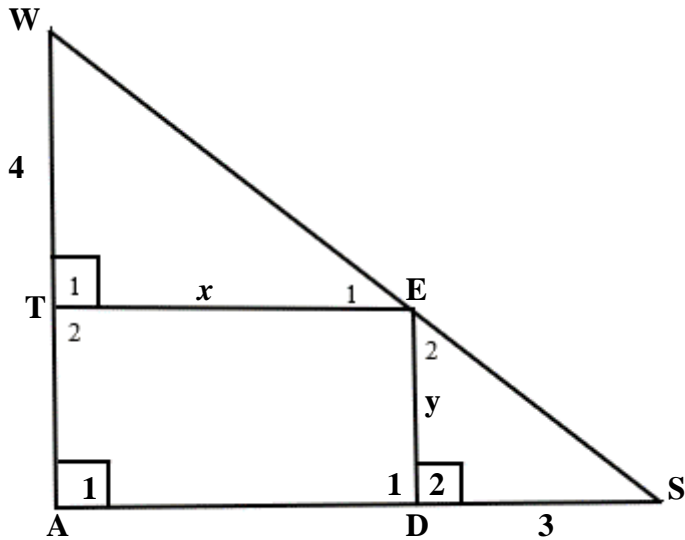
3.1.4 A three-sided shape with 3 equal angles

_____ (1)

3.1.5 A four-sided shape with equal diagonals that bisect each other but the diagonals are not perpendicular

_____ (1)

3.2 Given below ΔWAS and rectangle TADE.



3.2.1 Prove with reasons that $\Delta WTE \parallel \Delta EDS$.

STATEMENT	REASON

(4)

3.2.2 Complete the proportion statement for ΔWTE and ΔEDS .

$$\frac{4}{\quad} = \frac{x}{\quad}$$

Proportional sides of $\parallel \Delta s$.

$$\therefore xy = \underline{\hspace{4cm}}$$

(2)

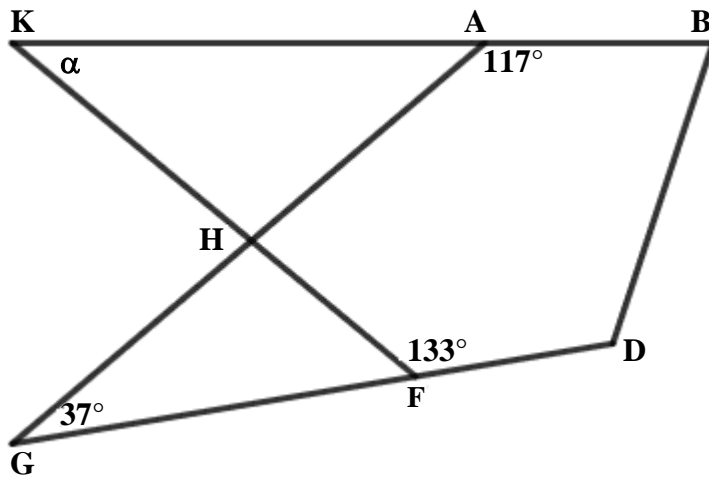
3.2.3 Hence, use the proportion statement above to calculate the area of rectangle TADE.

Area = _____

(1)

P.T.O.

3.3 In the shape below, $\hat{GAB} = 117^\circ$, $\hat{KFD} = 133^\circ$ and $\hat{G} = 37^\circ$.



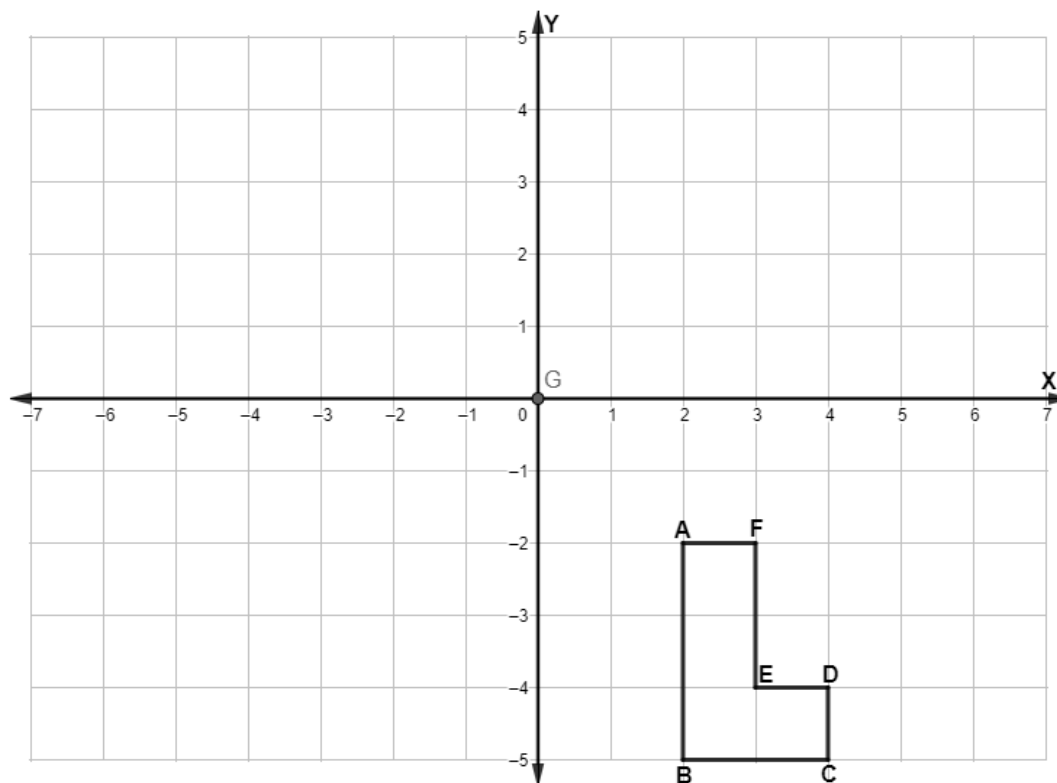
Determine, with reasons, the size of α .

STATEMENT	REASON

(6)
[18]

QUESTION 4

4.1



Draw the image of object ABCDEF translated 5 units to the left and 6 units upwards, on the same Cartesian plane.

(5)

4.2 A(1 ; 2), B(-2 ; 3) and C(-4; -1) are the vertices of ΔABC .

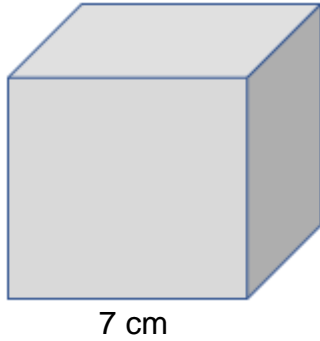
Write down the coordinates of A' , B' and C' after reflection in the Y-axis.

(3)

[8]

QUESTION 5

5.1 Given below is a cube with length = 7 cm.



5.1.1 Calculate the perimeter of the base of the cube in metres (m), correct to 2 decimal places.

(3)

5.1.2 Calculate the area of the base of the cube in cm^2 .

(2)

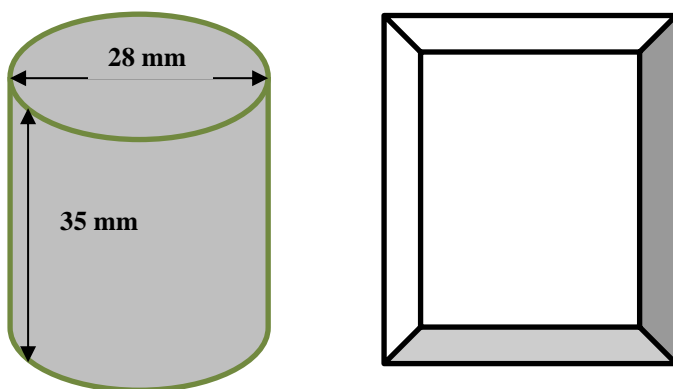
5.1.3 Calculate the volume of the cube in cm^3 .

(2)

5.1.4 Calculate the surface area of the cube correct to the nearest m².

(4)

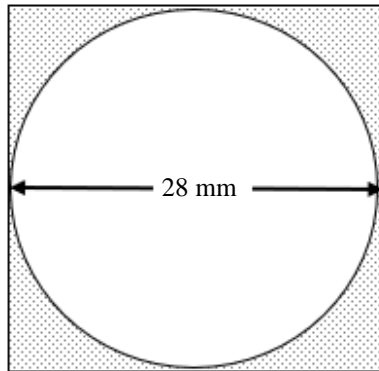
5.2 A cylinder with a diameter of 28 mm and a height of 35 mm shown below can fit exactly inside a square-based prism box also shown below.



5.2.1 Calculate the volume of the cylinder in mm³ if $\pi = \frac{22}{7}$.

(4)

5.2.2



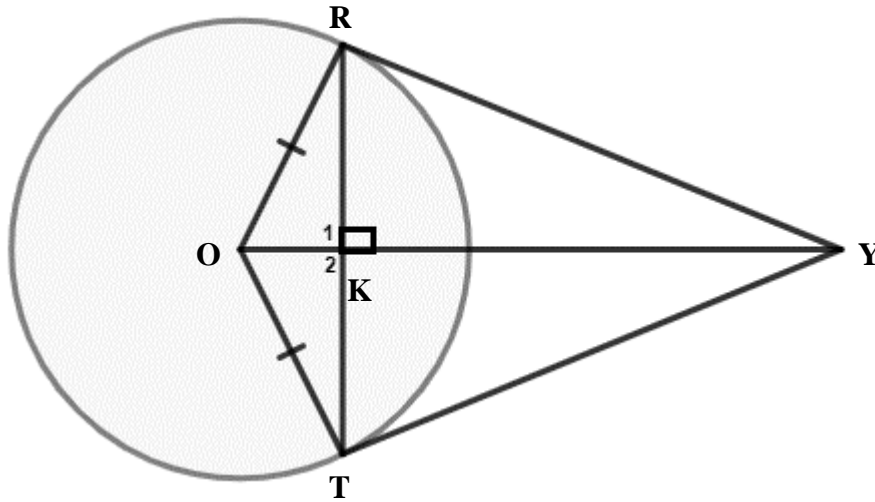
The diagram above shows the top view of the cylinder inside the square-based prism box in QUESTION 5.2.1.

Calculate the area of the shaded region if $\pi = 3,14$. Give your answer correct to 2 decimal places, in mm^2 .

(4)
[19]

QUESTION 6

6.1 In the diagram below, O is the centre of the circle with radius = 5 cm. $RT \perp OY$, $RT = 8$ cm and $OY = 12$ cm.



6.1.1 If $\pi = 3,14$, calculate the circumference of circle O.

(3)

6.1.2 Calculate the length of KY.

(5)

[8]

TOTAL: 75