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basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

NATIONAL ASSESSMENT
GENERAL EDUCATION CERTIFICATE (GEC)

2026 GRADE 9

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Subject: MATHEMATICS

Paper: 2

Marks: 75

Duration: 2 hours 30 minutes

Excluding 15 minutes reading time.

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This paper consists of 23 pages, excluding the cover page.

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Instructions to the learner:

1. You will receive 15 minutes reading time before you begin answering this paper.
2. Read all the instructions and questions carefully.
3. Answer all the questions in the answer booklet provided.
4. In Section A, do your calculations before choosing the correct option.
5. In Section B, do your calculations before writing your short response.
6. In Section C, show all the necessary calculations.
7. Non-programmable calculators may be used, unless stated otherwise.
8. Diagrams are not necessarily drawn to scale, and all lines are regarded as straight lines, unless stated otherwise.

The paper starts on the next page.



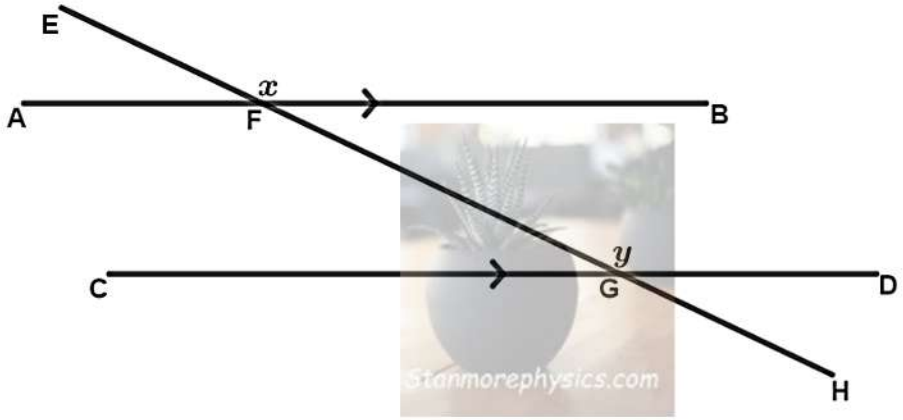
Do not turn the page until you are told to do so.

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SECTION A

1. Vertically opposite angles are …

   A equal.
   B supplementary.
   C complementary.
   D adjacent. (1)

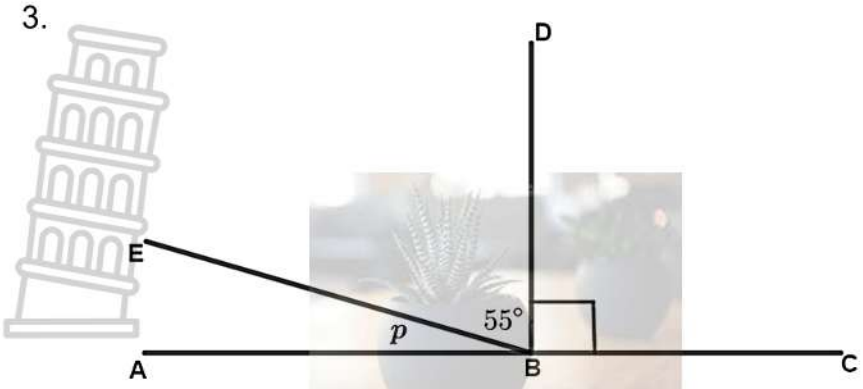
2. 

   Why is x equal to y?

   A Alternate angles; AB||CD
   B Corresponding angles; AB||CD
   C Corresponding angles; AB||EH
   D Alternate angles; AB||EH (1)

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3.



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What is the value of p?

A $145°$

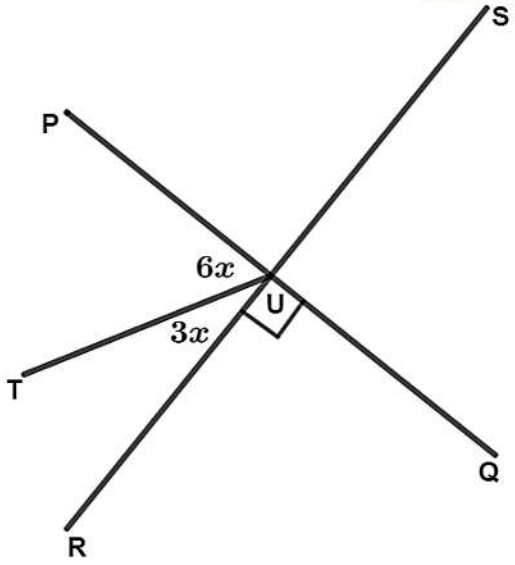
B $125°$

C $55°$

D $35°$ (1)

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4. PQ ⊥ RS



What is the value of x?

A $10°$

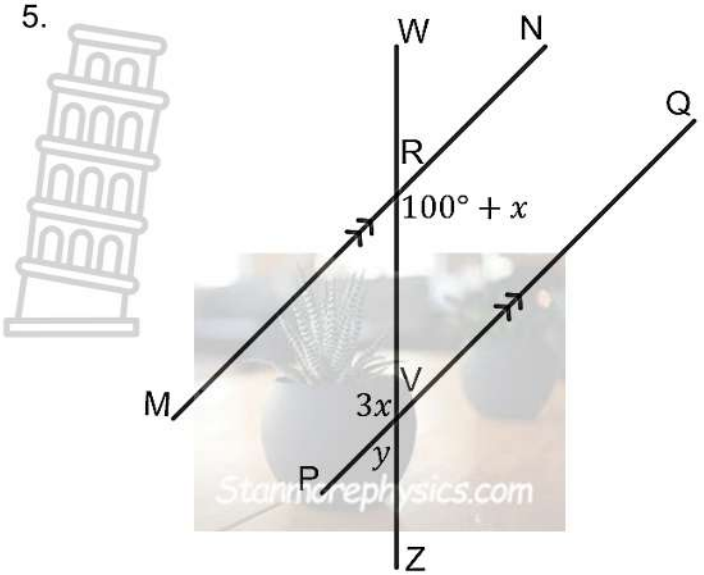
B $20°$

C $30°$

D $90°$ (1)

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5.



What is the value of y?

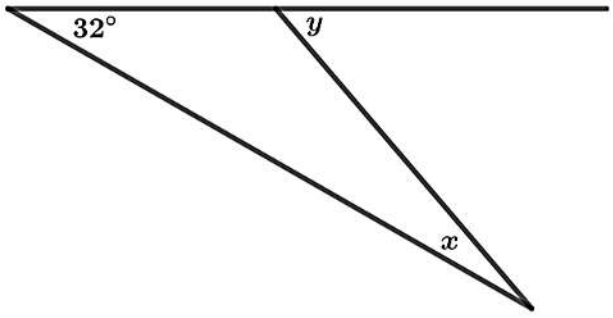
A $30°$

B $50°$

C $120°$

D $150°$ (1)

6.



Complete: $y = \cdots$

A $148° - x$

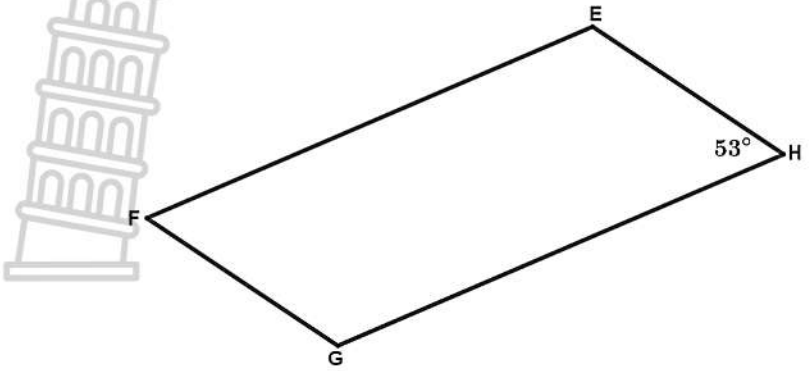
B $212° + x$

C $x + 32°$

D $x - 32°$ (1)

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7. EFGH is a parallelogram.



$F\hat{E}H + F\hat{G}H = \ldots$

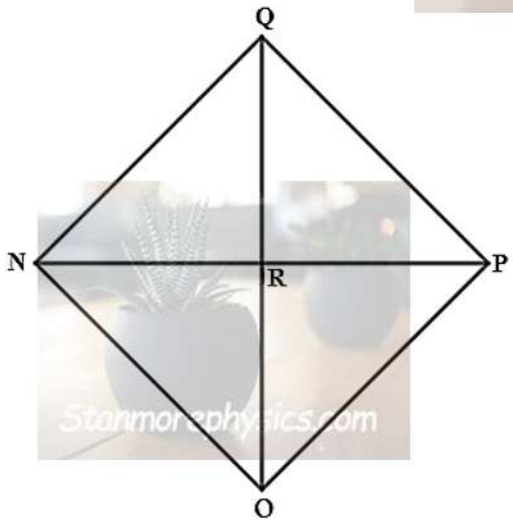
A $254°$

B $180°$

C $127°$

D $106°$ (1)

8. NOPQ is a square with QR = 2 cm.



NO = … cm

A 4

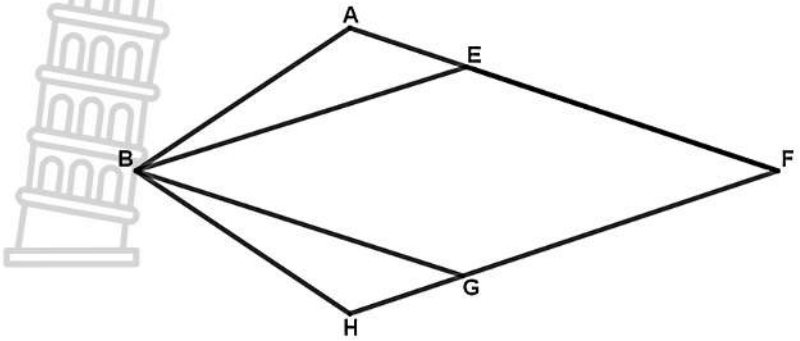
B 6

C 2,8

D 4,2 (1)

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9. ABHF is a kite and EBGF is a rhombus.



Which statement correctly describes the relationship between ΔABE and ΔHBG?

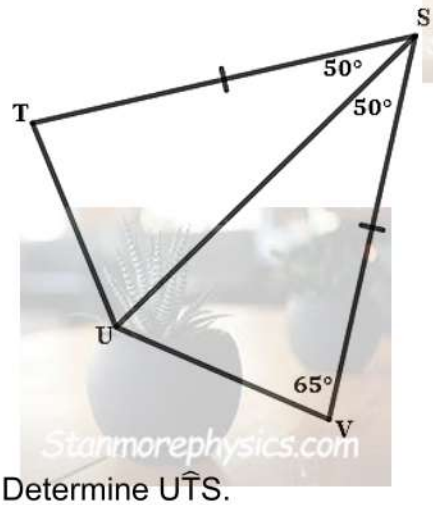
A The triangles are congruent but not similar.

B The triangles are similar but not congruent.

C The triangles are both similar and congruent.

D The triangles are not similar and not congruent. (1)

10.



Determine $\widehat{UTS}$.

A $100°$

B $115°$

C $50°$

D $65°$ (1)

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11. PQRS is a rectangle with length equal to 6 cm and breadth equal to 3 cm. Both dimensions are doubled to form rectangle MNOR.
The area of rectangle MNOR is …

A half of the area of rectangle PQRS.
B two times the area of rectangle PQRS.
C a quarter of the area of rectangle PQRS.
D four times the area of rectangle PQRS. (1)

12. In a school there are 210 learners. The teacher interviewed 105 Maths learners. Which statement is correct in relation to the maths learners?

A The sample is the learners interviewed.
B The population is the learners interviewed.
C The sample is the learners in the school.
D The population is the learners in the school. (1)

13. The researcher wants to determine whether boys perform better than girls in a school with 1 360 learners.
What is the best data collection method?

A Observes top ten learners' awards ceremony in the school.
B Collects and analyses report cards of boys and girls.
C Interviews girls if they think they perform better than boys.
D Interviews boys if they think they perform better than girls. (1)

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14.

10	22	23	24
33	11	12	42
41	31	24	30

Which of the following organises the data given?

A

Interval	Frequency
$10 \leq x \leq 20$	4
$20 \leq x \leq 30$	5
$30 \leq x \leq 40$	4
$40 \leq x \leq 50$	3

B

Interval	Frequency
$10 \leq x < 20$	3
$20 \leq x < 30$	3
$30 \leq x < 40$	3
$40 \leq x < 50$	2

C

KEY: 2|4=24

1	0;1;2
2	2;3;4
3	0;1;3
4	1;2

D

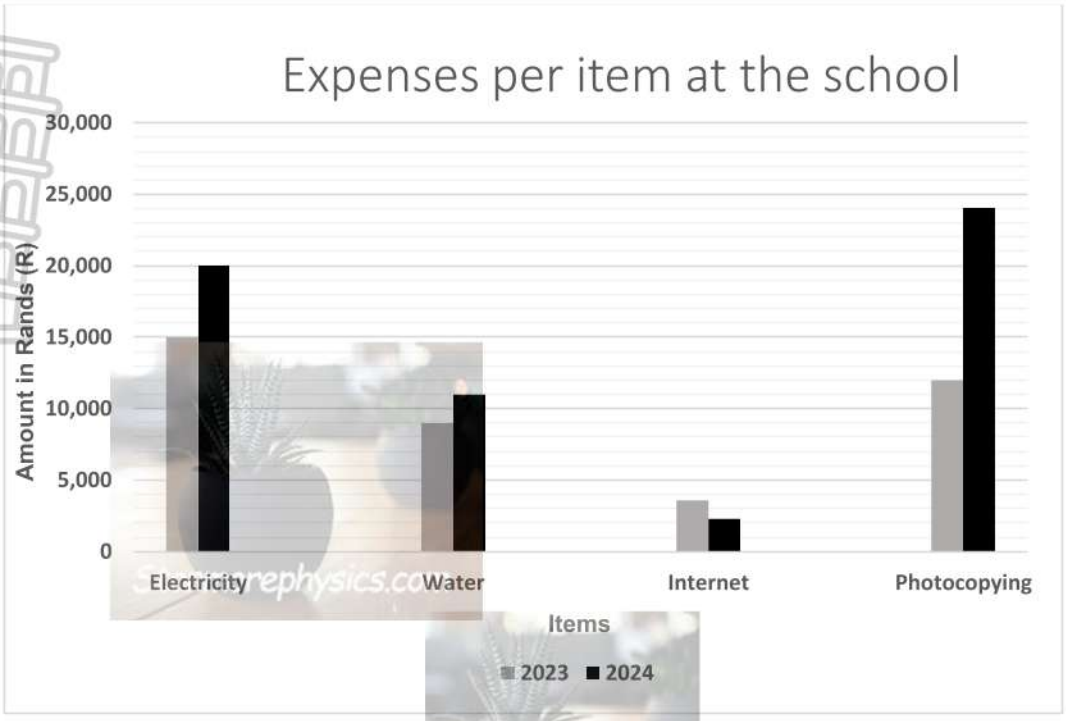
KEY: 2|4=24

1	0;1;2
2	2;3;4;4
3	0;1;3
4	1;2

(1)

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15.



Which item has increased by 100% from 2023 to 2024?

A Electricity
B Water
C Internet
D Photocopying (1)

16. Given:

9; 49; 68; 68; 68; 78; 90; 99

Which statement is true about the role of the outlier in the data?

A The outlier increases the range and median.
B The outlier increases the range and mode.
C The outlier decreases the mean.
D The outlier decreases the mode. (1)

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17.

1st toss	2nd toss	
	Heads	Tails
Heads	HH	HT
Tails	TH	TT

What is the probability of obtaining two heads?

A $\frac{1}{2}$

B $\frac{1}{3}$

C $\frac{1}{4}$

D $\frac{1}{8}$

(1)

18. A letter is chosen from the word COOKBOOK.
After 24 selections the letter O was chosen 6 times.
What is the relative frequency of selecting the letter O?

A 0,25

B 0,50

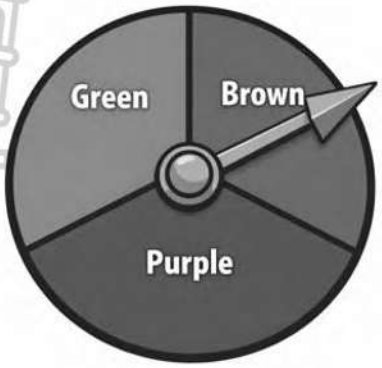
C 4

D 2

(1)

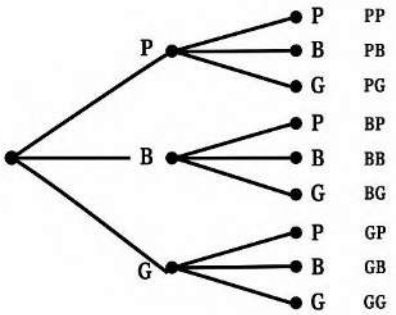
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19. The 3 colours on the spinner are the same size and all 3 are equally likely to occur. The 3 colours are green (G), brown (B) and purple (P).
The spinner is spun 3 times and the colour on which it stops is noted.

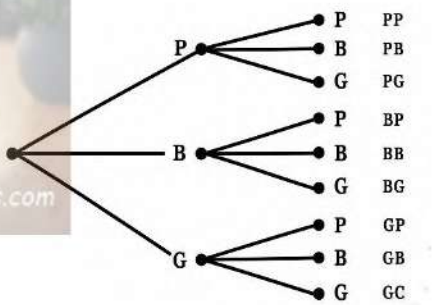


Which tree diagram represents the possible outcomes of this event?

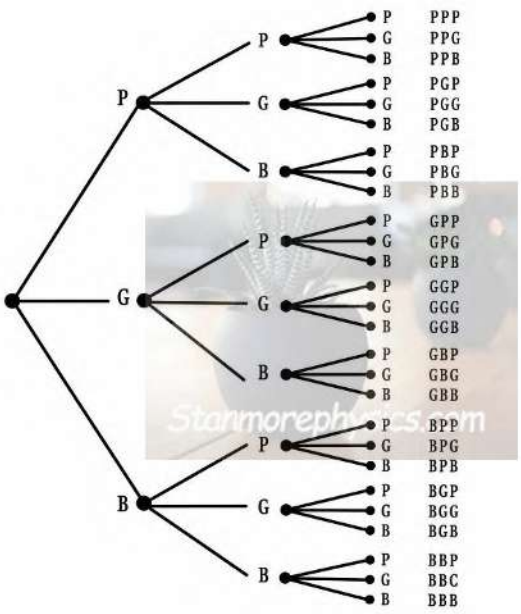
A



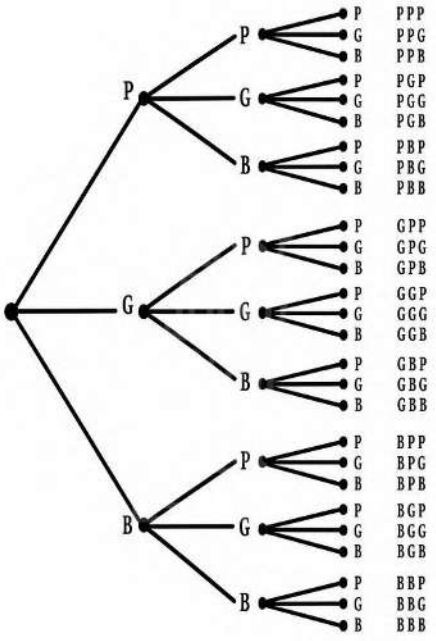
B



C



D



(1)

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20.



What is the probability of selecting a diamond out of a pack of 52 cards?

A 19%
B 25%
C 38%
D 50% (1)



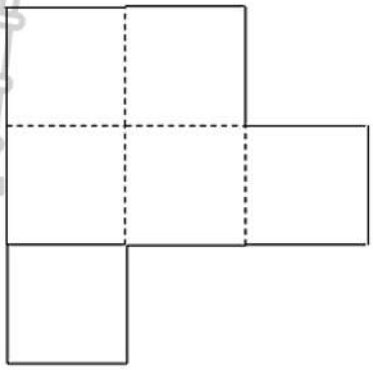
21. A sphere has …

A one curved edge and no faces.
B one flat circular face and one curved face.
C two identical circular faces and one curved surface.
D all points on its surface which are equidistant from the centre. (1)

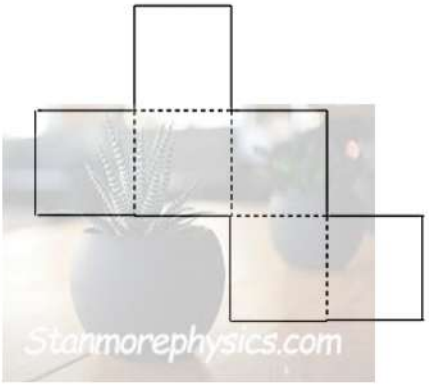
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22. Which of the following is a net of a cube?

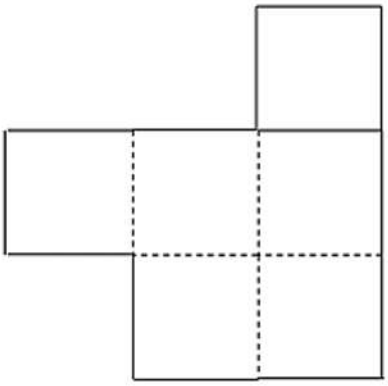
A



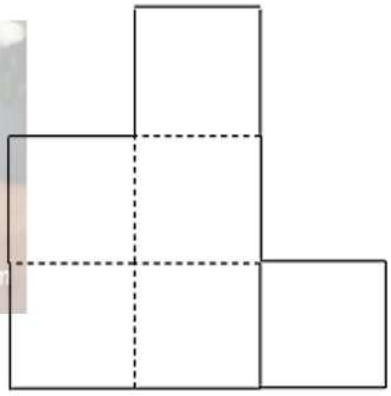
B



C



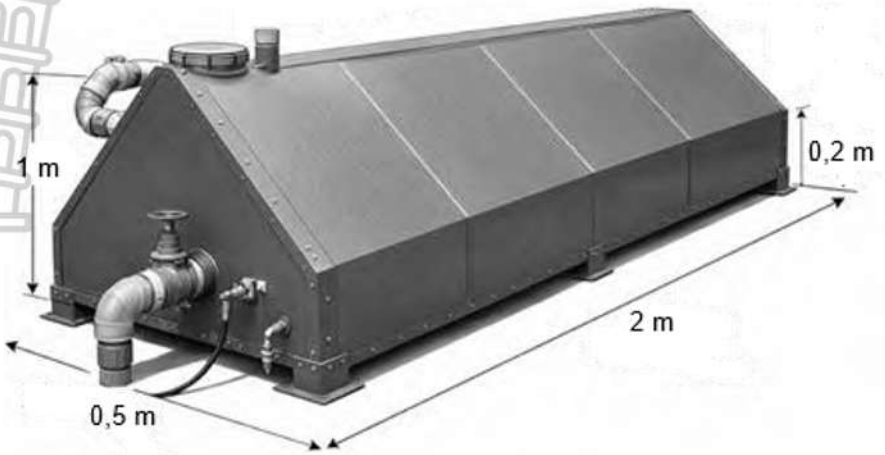
D



(1)

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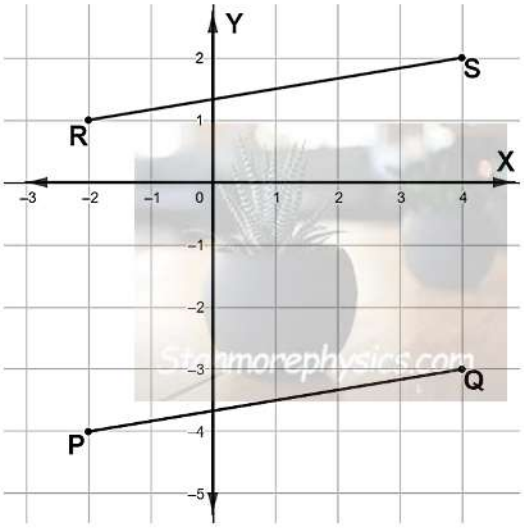
23. A triangular shaped tank with a base that is rectangular is completely filled with water.



If 1 m^3 = 1 000 litres, what is the capacity of the tank?

A 0,60 litres
B 0,84 litres
C 600 litres
D 840 litres (1)

24.

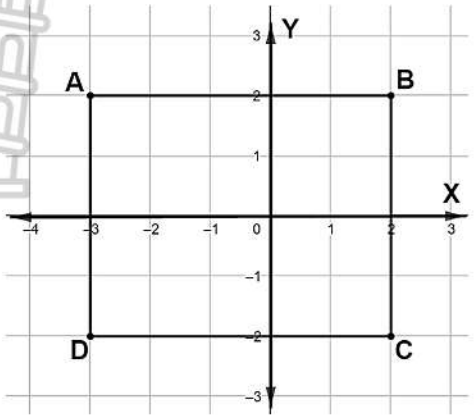


What is the translation of RS to PQ?

A 5 units up.
B 5 units down.
C 6 units to the right and 1 unit up.
D 6 units to the left and 1 unit down. (1)

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25. The dimensions of rectangle ABCD are reduced by a factor of a $\frac{1}{2}$ to form rectangle PQRS.



What is the area of rectangle PQRS?

A 5 units^2

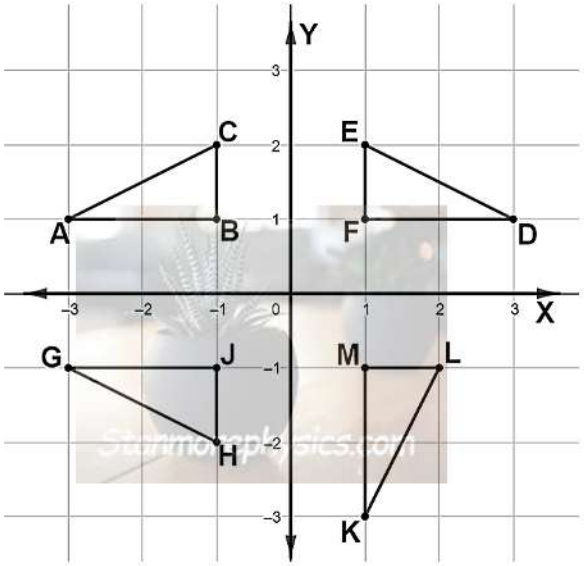
B 9 units^2

C 10 units^2

D 20 units^2 (1)

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26.



Which triangle is the reflection of ΔABC in the Y-axis?

A ΔDFE

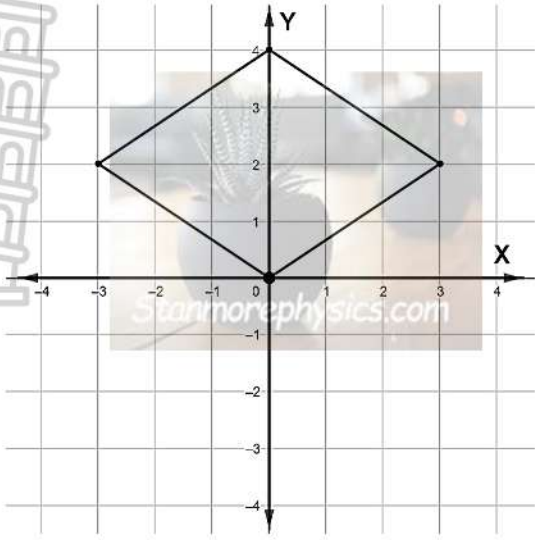
B ΔGJH

C ΔKML

D ΔABC (1)

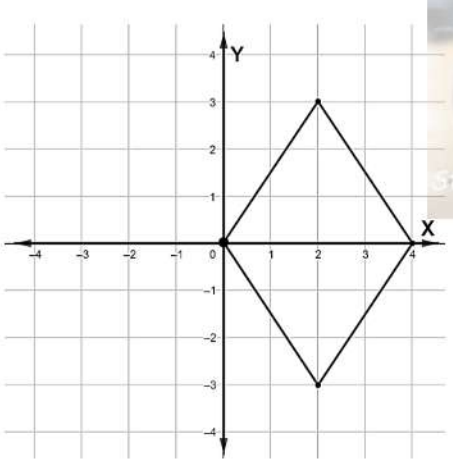
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27.

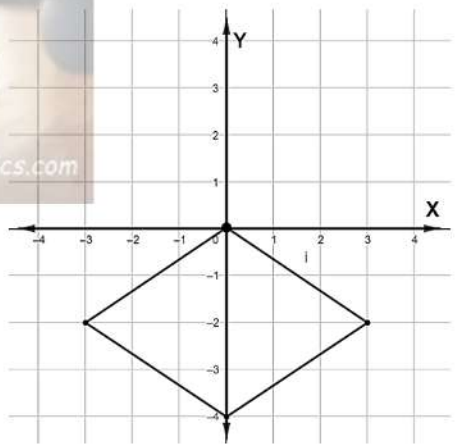


Which one of the following is a 180° rotation of the quadrilateral?

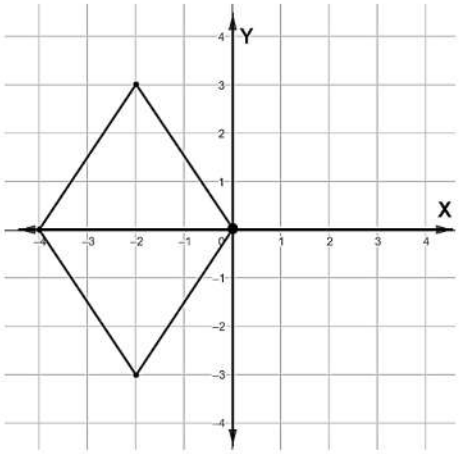
A



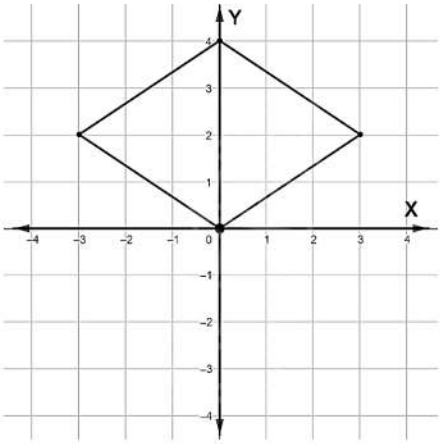
B



C



D



(1)

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28. The point $K(5;-3)$ is transformed to $K'(7;-5)$.
Which rule is used for the transformation?

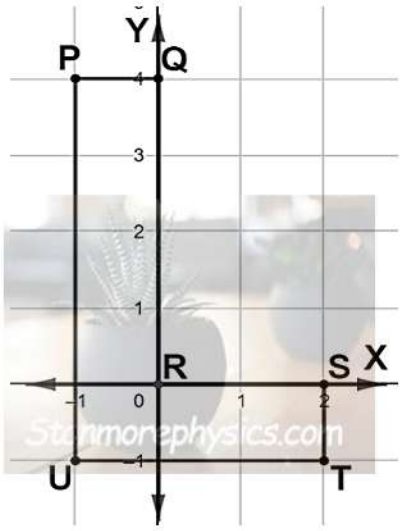
A $K(x;y) \rightarrow K'(x;-y)$
B $K(x;y) \rightarrow K'(-x;y)$
C $K(x;y) \rightarrow K'(x-2;y+2)$
D $K(x;y) \rightarrow K'(x+2;y-2)$ (1)

29. ΔABC with vertices $A(0;0)$, $B(-3;3)$ and $C(4;0)$ is enlarged by a factor of 3.
What are the co-ordinates of B'?

A $(-3;3)$
B $(-9;3)$
C $(-3;9)$
D $(-9;9)$ (1)

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30.



What are the co-ordinates of P' if PQRSTU is reflected in the line $y = x$?

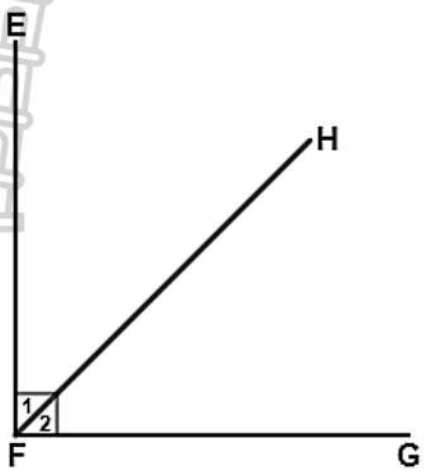
A $P'(-1;4)$
B $P'(4;-1)$
C $P'(1;4)$
D $P'(-4;-1)$ (1)

SECTION A TOTAL: [30]

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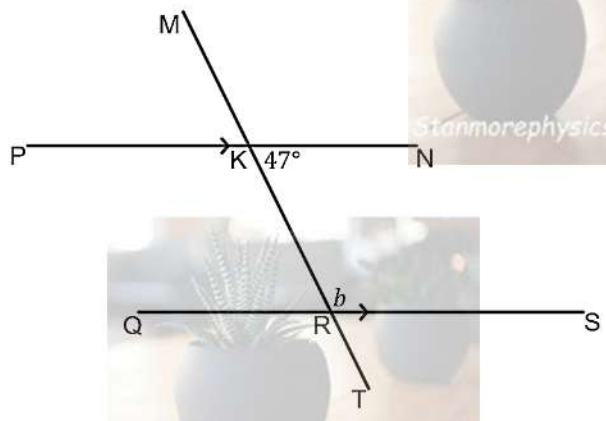
SECTION B

31.



What is the relationship between $\hat{F}_1$ and $\hat{F}_2$? (1)

32.



What is the value of b? (1)

33. Name a triangle that has only 2 sides that are equal. (1)

34. The diagonals of a parallelogram _____ each other. (1)

35. What is the perimeter of an equilateral triangle with a side equal to 7 cm? (1)

36. Given:

4; 6; 3; 5; 5; 6; 7; 25

Determine the range. (1)

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37. The method of collecting data by watching and recording behaviour without asking questions is called … (1)

38. In 2022, all 1 580 boys and girls from Manana community were included in a survey about the use of drugs. Of the 1 580 participants, 960 were girls. The results showed that 11% of boys and 5% of girls used drugs.

38.1 What method was used to collect data? (1)

38.2 How many girls used drugs? (1)

39. The probability of rolling a 3 on a fair die is $\frac{1}{6}$.

If you roll a die 60 times and get a 3 on 8 of them, the relevant frequency is $\frac{2}{15}$.
Why is the probability different from the relative frequency? (1)

40. In Qhawe Secondary school, learners must participate in one summer sport (athletics or cricket) and one winter sport (soccer, rugby or netball).

What is the probability that a learner does not participate in athletics? (1)

41. Which platonic solid is defined as a three-dimensional shape with four triangular faces, four vertices, and six edges? (1)

42. What is the formula to calculate the total surface area of the cylinder? (1)

43. What are the co-ordinates of P′, the reflection of P$(-3; 4)$ in the X-axis? (1)

44. ΔABC, with an area of 8 cm^2, is enlarged through the origin by a scale factor of 3 to form its image ΔA′B′C′.

What is the area of ΔA′B′C′? (1)

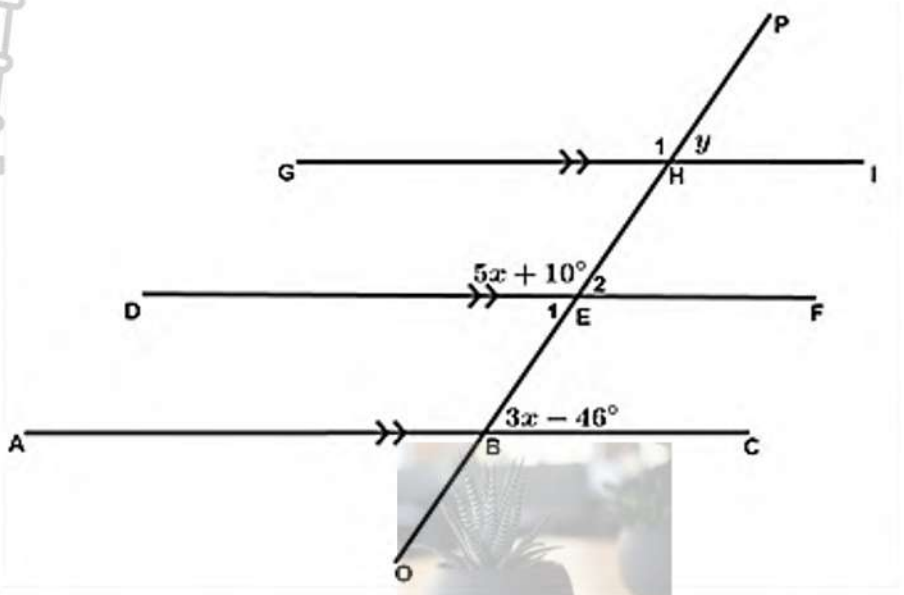
SECTION B TOTAL: [15]

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SECTION C

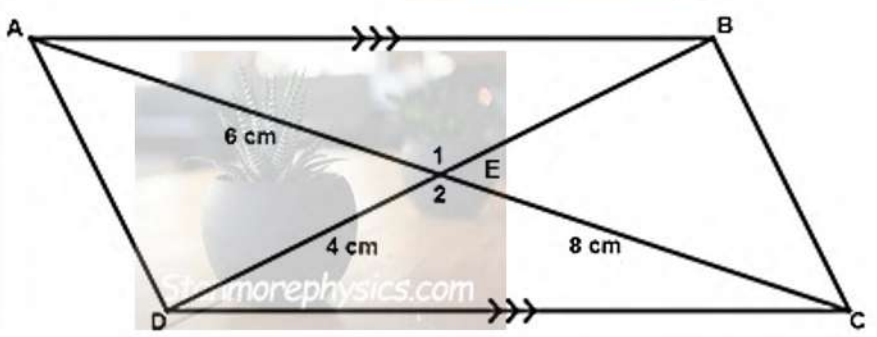
SHOW ALL CALCULATIONS.

45.



What is the value of y, with reasons? (5)

46.

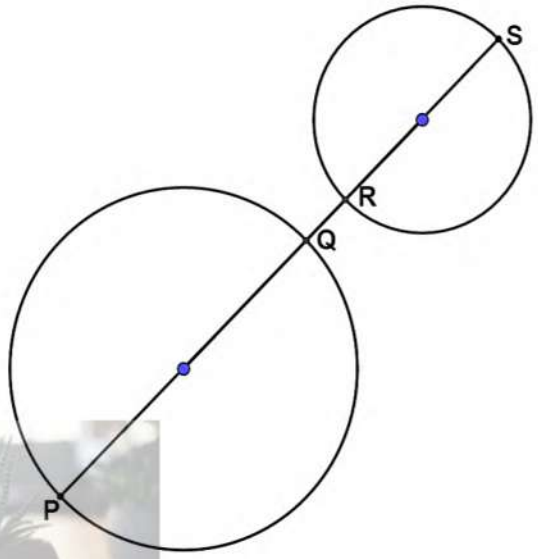


Determine the length of BE, with reasons. (5)

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47. The centre of two pools is on the same line PS, which is equal to 25 m.
The area of the small circle is 9π m^2 and the circumference of the larger circle is 16π m.





Calculate the distance (QR) between the two pools. (4)

48. Given:
10; 20; 30; 19; 14; 30; 40; 25; 15; 18.
Determine the mean of the data. (3)

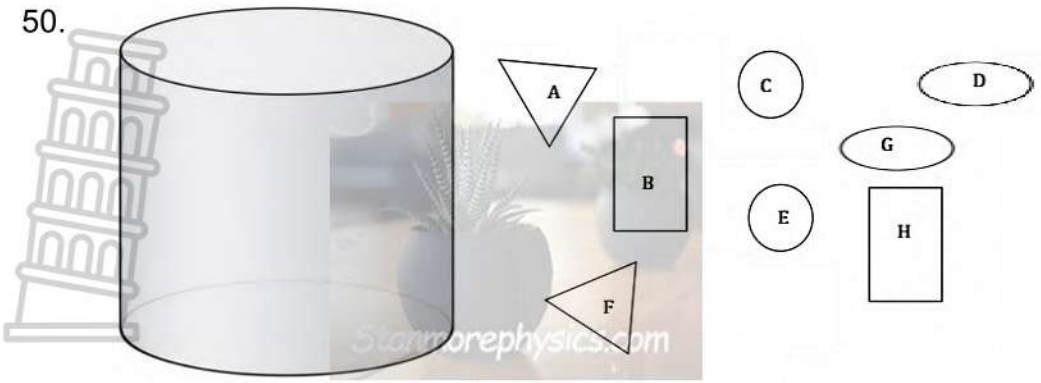
49. A gym tracked the number of weekly push-up sessions and the body fat percentages of five members. The aim is to determine the relationship between push-up sessions frequency and body composition.

Member	Weekly push-up sessions	Body fat percentage
A	1	33%
B	2	27%
C	4	20%
D	5	18%
E	6	14%

Draw the scatter plot. (3)

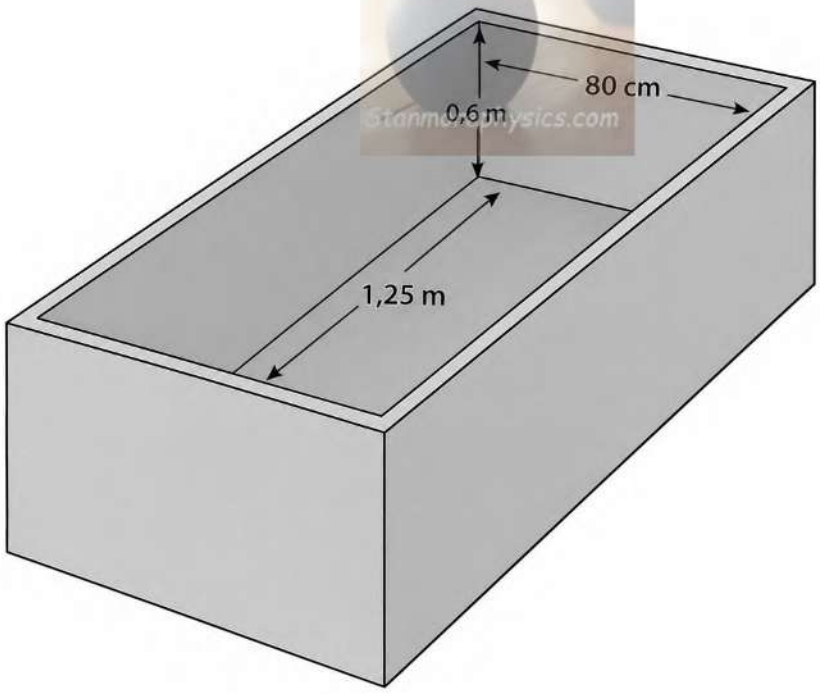
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50.



Which shapes (A–H) form the net of the closed cylinder? (3)
Write down the letters only.

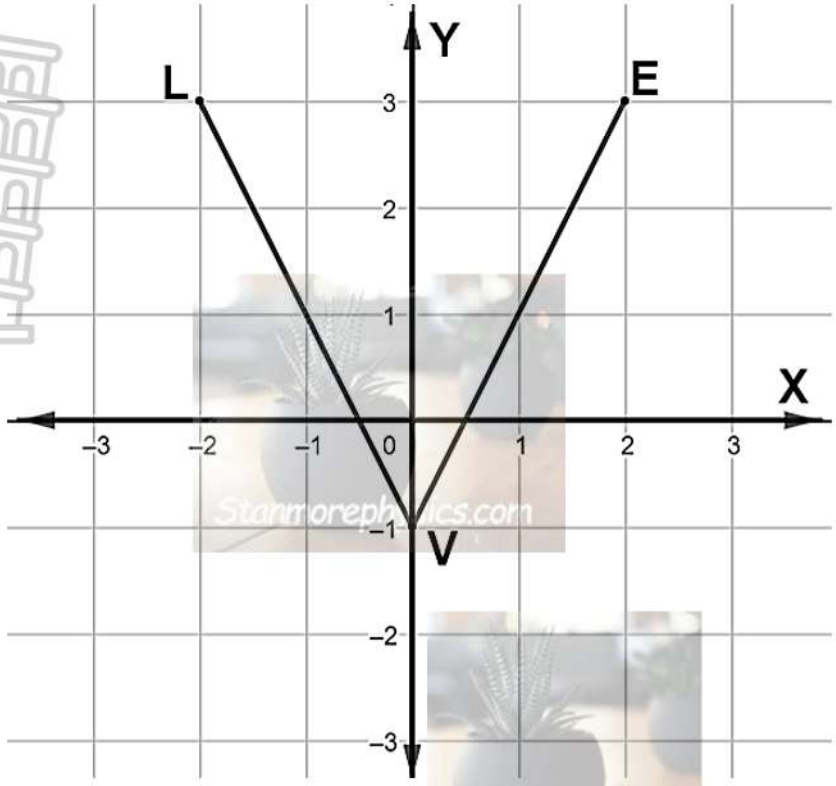
51. The laboratory stores a liquid chemical in a rectangular metal tank with internal dimensions as shown below.
For safety reasons only 85% of the tank's volume can be used.



What is the maximum volume (m^3) of the liquid chemical that may be stored in the tank for safety reasons? (4)

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52.



Write down the co-ordinates of L′, V′ and E′ if the V-shape is reflected in the line $y = x$. (3)

SECTION C TOTAL: [30]
TOTAL: [75]

End of paper.

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basic education
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Basic Education
REPUBLIC OF SOUTH AFRICA

MARKING GUIDELINE 2026
MATHEMATICS PAPER 2
GRADE 9

SECTION A

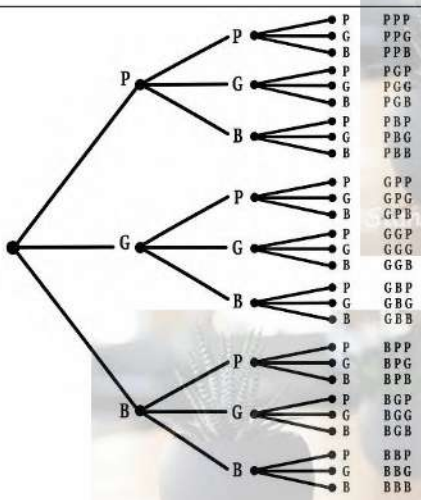
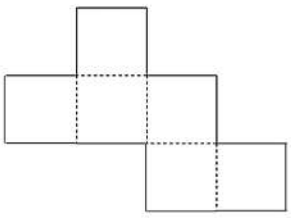
- *One mark per answer.*
- *There are no half marks.*
- *Tick* (✓) only the correct answer and underline the incorrect one.

No.		Expected answer	Key (✓)	Rationale
1.	A	equal	✓	
2.	B	Corresponding angles; AB∥CD	✓	
3.	D	35°	✓	$p + 55° = 90°$ …DB ⊥ AC $p = 90° - 55°$ $p = 35°$ **OR** $p + 55° + 90° = 180°$ …Adj ∠s on a str line $p + 145° = 180°$ $p = 35°$
4.	A	10°	✓	$6x + 3x = 90°$… PQ ⊥ RS $9x = 90°$ $\frac{9x}{9} = \frac{90°}{9}$ $x = 10°$
5.	A	30°	✓	$3x = 100° + x$ …Alt ∠s; MN∥PQ $3x - x = 100°$ $\frac{2x}{2} = \frac{100°}{2}$ $x = 50°$ $3(50°) = 150°$ $150° + y = 180°$ …Adj.∠s on a str line $y = 180° - 150°$ $y = 30°$
6.	C	$x + 32°$	✓	$y = x + 32°$… Ext ∠ of a Δ

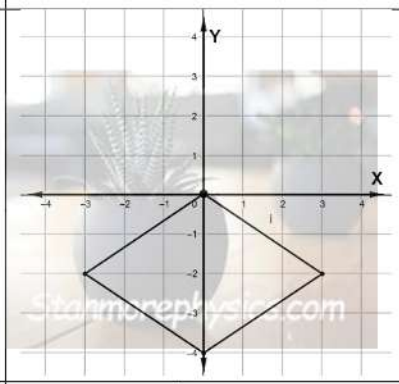
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No.		Expected answer	Key (✓)	Rationale
7.	A	$254°$	✓	$F\hat{E}H + 53° = 180°$ …Co-int ∠s; FE∥GH $F\hat{E}H = 127°$ $F\hat{E}H = F\hat{G}H$ …Opp ∠s of a parm $F\hat{E}H + F\hat{G}H = 2(127°)$ $= 254°$
8.	C	2,8	✓	RO = 2 cm…diag of a sq. bisect QO = 4 cm $NO^2 + NQ^2 = QO^2$…Pyth $2NO^2 = QO^2$…side of sq = $2NO^2 = 4^2$ $2NO^2 = 16$ $NO = \sqrt{8} = 2{,}8$ cm
9.	C	The triangles are both similar and congruent.	✓	All corresponding angles and all corresponding sides are equal.
10.	D	$65°$	✓	In ΔUTS and ΔUVS: $T\hat{S}U = V\hat{S}U = 50°$...Given US = US …Common side TS = SV …Given ∴ΔUTS ≡ ΔUVS …SAS $U\hat{T}S = U\hat{V}S = 65°$ …ΔUTS ≡ ΔUVS
11.	D	four times the area of rectangle PQRS.	✓	Area of PQRS $= l \times b$ $= 6 \times 3$ $= 18$ cm^2 Area of MNOR $= l \times b$ $= (2 \times 6) \times (2 \times 3)$ $= 12 \times 6$ $= 72$ cm^2 72 cm$^2 \div 18$ cm$^2 = 4$
12.	A	The sample is the learners interviewed.	✓	Correctly identified the sample
13.	B	Collects and analyses report cards of boys and girls.	✓	Used reliable source of information
14.	D	KEY: 2|4=24 1 | 0;1;2 2 | 2;3;4;4 3 | 0;1;3 4 | 1;2	✓	Correctly grouped the data using stem and leaf.
15.	D	Photocopying	✓	R12 000 in 2023 to 24 000 in 2024 is a 100% increase.

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No.		Expected answer	Key (✓)	Rationale
16.	C	The outlier decreases the mean.	✓	Data with outlier Mean = 66,1 Data without outlier Mean = 74,3
17.	C	$\frac{1}{4}$	✓	
18.	A	0,25	✓	Relative frequency $= \frac{\text{number of times that O was chosen}}{\text{total possible selections}}$ $= \frac{6}{24}$ $= \frac{1}{4}$ $= 0{,}25$
19.	D		✓	There should be 3 sets of branches and outcome correctly indicated.
20.	B	25%	✓	$\text{P(diamond)} = \frac{\text{Number of diamonds}}{\text{Total number of cards}}$ $= \frac{13}{52}$ $= \frac{1}{4}$ $= 25\%$
21.	D	all points on its surface which are equidistant from the centre.	✓	A sphere has no flat faces, **no edges**, and no vertices.
22.	B		✓	All six squares are correctly connected and foldable into a closed cube.

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No.		Expected answer	Key (✓)	Rationale
23.	C	600 litres	✓	Volume of triangular prism $h = (1 - 0{,}2)$ m $h = 0{,}8$ m $V = \frac{1}{2}bhH$ $= \frac{1}{2} \times 0{,}5 \times 0{,}8 \times 2$ $= 0{,}4$ m^3 Volume of rectangular prism: $V = lbH$ $= 0{,}5 \times 0{,}2 \times 2$ $= 0{,}2$ m^3 Total volume $= 0{,}2 + 0{,}4 = 0{,}6$ m^3 ∴Capacity $= 0{,}6 \times 1\,000 = 600$ litres
24.	B	5 units down	✓	$R(-2;1) \rightarrow P(-2;1-5) \rightarrow P(-2;-4)$ $S(4;2) \rightarrow Q(4;2-5) \rightarrow Q(4;-3)$ ∴ 5 units down
25.	A	5 units^2	✓	Length of PQRS $= 5 \times 0{,}5 = 2{,}5$ Width of PQRS $= 4 \times 0{,}5 = 2$ Area of rectangle PQRS $= 2{,}5 \times 2$ $= 5$ units^2
26.	A	ΔDFE	✓	For a reflection in the Y-axis the rule is: $(x;y) \rightarrow (-x;y)$
27.	B		✓	The quadrilateral has been rotated $180°$ around the point $(0;0)$.
28.	D	$K(x;y) \rightarrow K'(x+2;y-2)$	✓	$K(5;-3) \rightarrow K'(5+2;-3-2) \rightarrow K'(7;-5)$
29.	D	$(-9;9)$	✓	$B(-3;3) \rightarrow B'(-3 \times 3;3 \times 3) \rightarrow B'(-9;9)$
30.	B	$P'(4;-1)$	✓	$P(-1;4)$ For a reflection in the line $y = x$ the rule is: $(x;y) \rightarrow (y;x)$ ∴ $P(-1;4) \rightarrow P'(4;-1)$
				SECTION A TOTAL: [30]

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SECTION B

- *One mark per answer.*
- *There are no half marks.*
- *Tick* (✓) only the correct answer and underline the incorrect one.

No.	Expected answer		Mark
31.	Complementary angles. ✓**A** Accept: $\hat{F}_1 + \hat{F}_2 = 90°$ ✓**A**		(1)
32.	$b + 47° = 180°$ …Co-int. ∠s; PN‖QS $b = 180° - 47°$ $b = 133°$ ✓**A**		(1)
33.	Isosceles triangle✓**A**		(1)
34.	bisect ✓**A**		(1)
35.	Perimeter $= 3 \times 7$ $= 21$ cm ✓**A**		(1)
36.	Range $= 25 - 3 = 22$ ✓**A**		(1)
37.	observation. ✓**A**		(1)
38.	38.1	Census ✓**A** **OR** Survey ✓**A**	(1)
	38.2	$\frac{5}{100} \times 960$ $= 48$ ✓**A**	(1)
39.	The number of trials is not enough. ✓**A** **OR** The relative frequency is a practical value that does not compare with theoretical value. ✓**A**		(1)
40.	Probability $= \frac{\text{number of favourable outcomes}}{\text{total number of possible events}}$ $= \frac{1}{2}$ or $0{,}5$ ✓**A**		(1)
41.	Tetrahedron ✓**A** **OR** Triangular pyramid ✓**A**		(1)
42.	$SA = 2\pi rh + 2\pi r^2$ ✓**A** **OR** $SA = 2\pi r(h + r)$ ✓**A** **Accept any other correct surface area formula.**		(1)
43.	$P'(-3; -4)$ ✓**A**		(1)
44.	$\Delta A'B'C' = (3)^2 \times 8$ $= 72$ cm^2 ✓**A**		(1)
			SECTION B TOTAL: [15]

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SECTION C

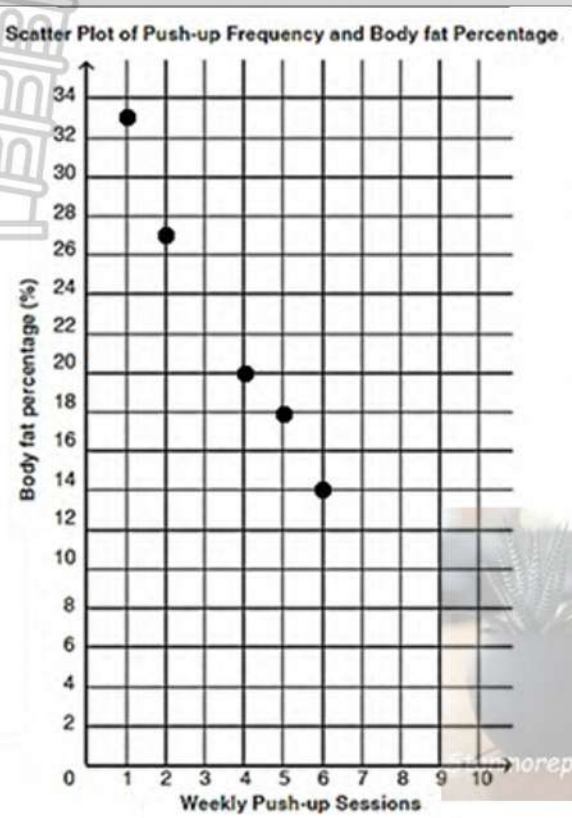
- Do not penalise the learner for the same mistake twice.
- *There are no half marks.*
- Underline errors committed by learners do not place a cross (X).

No.	Expected answer	Rationale/Clarification	Mark
45.	$\hat{E}_2 = E\hat{B}C$ …Corr ∠s; AC∥DF ✓**S/R** $\hat{E}_2 = 3x - 46^\circ$ $3x - 46^\circ + 5x + 10^\circ = 180^\circ$ … Adj.∠s on a str line✓**S/R** $8x = 180^\circ - 36^\circ$ $\frac{8x}{8} = \frac{216^\circ}{8}$ $x = 27^\circ$ ✓**CA** $E\hat{B}C = 3(27^\circ) - 46^\circ$ $E\hat{B}C = 81^\circ - 46^\circ$ $E\hat{B}C = 35^\circ$ $y = E\hat{B}C$ …Corr ∠s; AC∥GI ✓**S/R** $y = 35^\circ$ ✓**CA** **OR** $\hat{E}_2 = 3x - 46^\circ$ …Corr ∠s; AC∥DF ✓**S/R** $3x - 46^\circ + 5x + 10^\circ = 180^\circ$ … Adj.∠'s on a str line✓**S/R** $8x = 180^\circ - 36^\circ$ $\frac{8x}{8} = \frac{216^\circ}{8}$ $x = 27^\circ$ ✓**CA** $H\hat{E}D = 5(27^\circ) + 10^\circ$ $H\hat{E}D = 135^\circ + 10^\circ$ $H\hat{E}D = 145^\circ$ $\hat{H}_1 = H\hat{E}D$ …Corr ∠s; DF∥GI ✓**S/R** $\hat{H}_1 = 145^\circ$ $\hat{H}_1 + y = 180^\circ$ … Adj ∠s on a str line $145^\circ + y = 180^\circ$ $y = 180^\circ - 145^\circ$ $y = 35^\circ$ ✓**CA** **Accept any correct solution.**	Statement and reason: 1 mark Statement and reason: 1 mark Answer: 1 mark Statement and reason: 1 mark Answer: 1 mark **OR** Statement and reason: 1 mark Statement and reason: 1 mark Answer: 1 mark Statement and reason: 1 mark Answer: 1 mark	(5)

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No.	Expected answer	Rationale/Clarification	Mark
46.	$B\hat{A}C = A\hat{C}E$ …Alt ∠s; AB∥DC ✓**S/R** $A\hat{B}D = C\hat{D}B$ …Alt ∠s; AB∥DC $\hat{E}_1 = \hat{E}_2$ …Vert opp ∠'s or ∠'s of a Δ ✓**S/R** ∴ΔAEB ⫼ΔCED …AAA ✓**A** $\frac{AE}{EC} = \frac{BE}{ED}$ $\frac{6}{8} = \frac{BE}{4}$ ✓**M** $8 \times BE = 6 \times 4$ $\frac{8 \times BE}{8} = \frac{24}{8}$ BE = 3 cm ✓**CA**	Statement and reason: 1 mark Statement and reason: 1 mark ΔAEB ⫼ΔCED …AAA:1 mark Substitution: 1 mark Answer: 1 mark	(5)
47.	Area of small circle = 9π m^2 $A = \pi r^2$ $9\pi = \pi r^2$ $r^2 = \frac{9\pi}{\pi}$ $r^2 = 9$ $r = \sqrt{9}$ $r = 3$ m RS = 6 m QR = 25 m − 6 m − 16 m = 3 m ✓**CA** Circumference of larger circle = 16π m $C = 2\pi r$ $16\pi = 2\pi r$ ✓**M** $r = \frac{16\pi}{2\pi}$ $r = 8$ m ✓**A** PQ = 16 m ✓**CA**	Setting up of both equations: 1 mark Both radii: 1 mark Doubling both radii: 1 mark Answer: 1 mark	(4)
48.	10; 20; 30; 19; 14; 30; 40; 25; 15; 18 Sum of data = 221 ✓**M** Mean = $\frac{\text{sum of the data}}{\text{number of data}}$ = $\frac{221}{10}$ ✓**CA** = 22,1 ✓**CA** **Answer only full marks.**	Sum of data: 1 mark Substitution: 1 mark Answer: 1 mark	(3)

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No.	Expected answer	Rationale/Clarification	Mark
49.	 ✓✓✓**A**	All correct points: 3 marks **OR** Any 4 correct points: 2 marks **OR** Any 2 correct points: 1 mark	(3)
50.	CBE **OR** CHE ✓✓✓**A** In any order.	one circle: 1 mark one rectangle: 1 mark one circle: 1 mark	(3)
51.	80 cm = 0,8 m ✓**A** $V = l \times b \times h$ V = 1,25 m × 0,8 m × 0,6 m ✓**M** V = 0,6 m^3 ✓**CA** Calculate 85% of volume 85% of 0,6 = 0,51 m^3 ✓**CA**	0,8 m: 1 mark Substitution: 1 mark Answer: 1 mark 0,51 m^3: 1 mark	(4)
52.	L′(3; −2) ✓**A** V′(−1; 0) ✓**A** E′(3; 2) ✓**A**	Answer: 1 mark Answer: 1 mark Answer: 1 mark	(3)
		SECTION C TOTAL: [30]	
		TOTAL: [75]	

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