

PRINCIPAL EXAMINER'S REPORT



BOTSWANA
EXAMINATIONS
COUNCIL

JCE MATHEMATICS 2025



PAPER 1: MULTIPLE CHOICE

General Comments

The performance of the candidates in this component has been declining since 2021, and this year was no exception. The mean for this year was 11.33 down from 12.78 last year. As usual, the performance varied across the items, the proportion of candidates who got the item correct varied between 10% and 58% which is a very worrisome performance. More worryingly is the fact that the distribution of the candidates across options for different questions indicates inadequate grasp of the mathematical concepts by the majority of the candidates with some of the answers even attracting the lowest proportion of candidates for some questions. The questions were generally spread across topics. There is need to help candidates to improve this performance. The strongest distractors and distribution of the candidates across the options generally indicate the misconceptions that the candidates may have. Where reported, such information should be used to improve the teaching and learning.

Generally, Multiple-Choice items have a guessing factor that is considered to be the lowest proportion of being able to get the item correct without necessarily knowing the answer. For a Multiple-Choice item with four options, the guessing factor is 25% and any item which has the proportion of candidates who got it correct lower than the guessing factor is a cause for concern. Candidates should be encouraged to always read the question for understanding before they select an answer.

The report is mainly in table format, showing the proportion of candidates at each of the options. The key for reading the table:

Prop. the percentage of candidates that selected the option as their answer

Key the option that was taken as the answer for the item

Comments on Individual Questions

Question 1

Option	Prop.	Key	Comments
A	0.20	C	Candidates performed poorly in this item. The distribution of the candidates across the options indicates that the candidates were doing guess work with option D even attracting the largest proportion than the answer. Most of them could not convert fractions to ratio.
B	0.24		
C	0.24		
D	0.32		

Question 2

Option	Prop.	Key	Comments
A	0.35	B	This question was fairly done by most of the candidates as they were able to convert time from 24-hour clock to 12-hour clock. A lot of the candidates could not determine whether it's a.m. or p.m.
B	0.58		
C	0.04		
D	0.03		



Question 3

Option	Prop.	Key	Comments
A	0.26	C	The performance of candidates in this item was poor. Most of the candidates have not grasped the law of indices that is addition of powers when multiplying indices with the same base. Some were dividing, others subtracting and others were multiplying the powers. This is the reason for almost even distribution of candidates across the options.
B	0.24		
C	0.31		
D	0.19		

Question 4

Option	Prop.	Key	Comments
A	0.39	A	Candidates did poorly in this item, but a lot of them failed to correctly interpret the word problem into a mathematical statement. For example, so many of them did not multiply 0.85 by 2 and got 2.7 instead.
B	0.17		
C	0.28		
D	0.16		

Question 5

Option	Prop.	Key	Comments
A	0.32	B	The performance of candidates was fair, from the responses it shows that they have good understanding of linear sequences, a lot of them did not divide the difference between the third and fifth term by 2 to get the common difference, and as a result went for option A.
B	0.42		
C	0.20		
D	0.06		

Question 6

Option	Prop.	Key	Comments
A	0.43	A	Candidates performed fairly in this item, denoting direction in vectors is still a challenge for most of the candidates.
B	0.23		
C	0.12		
D	0.22		

Question 7

Option	Prop.	Key	Comments
A	0.16	C	This item was fairly done, most of the candidates either subtracted the 25% or made errors when calculating.
B	0.15		
C	0.48		
D	0.21		

Question 8

Option	Prop.	Key	Comments
A	0.23	D	The item was poorly done with the key attracting the lowest proportion of the candidates. Most of the candidates seemed to know that exterior angles of a polygon add to 360° but used 45° instead of 30° for half an angle of an equilateral triangle. This is why most of them went for option B.
B	0.49		
C	0.18		
D	0.10		



Question 9

Option	Prop.	Key	Comments
A	0.25	B	The item was poorly done, most of the candidates simply divided adult dog dose with puppy dose or some other wrong calculation. Only around 28% of the candidates got the item correct.
B	0.28		
C	0.34		
D	0.13		

Question 10

Option	Prop.	Key	Comments
A	0.40	B	The question was poorly done. This is another item where the answer was selected by the lowest proportion with options A and D being the most popular. Most of the candidates got a gradient of 2 or -2 all of which are incorrect. Candidates failed to calculate the gradient of a straight line.
B	0.16		
C	0.16		
D	0.28		

Question 11

Option	Prop.	Key	Comments
A	0.53	B	Candidates performed poorly on this question with most of them multiplying 16 by 4 and adding 288 which is incorrect.
B	0.27		
C	0.09		
D	0.10		

Question 12

Option	Prop.	Key	Comments
A	0.22	C	This question was also fairly done. Candidates could not identify end elevation.
B	0.23		
C	0.45		
D	0.09		

Question 13

Option	Prop.	Key	Comments
A	0.22	C	Candidates performed fairly on this item. The candidates showed a good understanding of the graph of a straight line ($y = mx + c$), the fact that file opening charge is constant c and is where the line crosses the y -axis. Some candidates had problems reading values from the graph.
B	0.08		
C	0.58		
D	0.12		

Question 14

Option	Prop.	Key	Comments
A	0.18	A	Candidates performed poorly on this question, many of the candidates could read the correct value from the graph but did not subtract the file opening charge and as a result went for option C.
B	0.18		
C	0.49		
D	0.14		



Question 16

Option	Prop.	Key	Comments
A	0.06	D	Candidates did fairly in this question. However, option B, which has $15c - 16d$ instead of $15d - 16d$, was the strongest distractor.
B	0.31		
C	0.06		
D	0.57		

Question 17

Option	Prop.	Key	Comments
A	0.19	D	The performance of candidates in this question was poor, most of them went for the wrong options mainly option B showing that candidates have no grasp of how to solve simultaneous equations using a graph.
B	0.31		
C	0.17		
D	0.32		

Question 18

Option	Prop.	Key	Comments
A	0.47	C	The performance of candidates in this question was poor with the key attracting the lowest proportion of the candidates. A lot of them chose option A, they fail to draw the image of point K after enlargement give the Centre and scale factor of enlargement.
B	0.24		
C	0.14		
D	0.15		

Question 19

Option	Prop.	Key	Comments
A	0.31	A	The performance of candidates in this question was poor. Candidates failed to expand the square brackets.
B	0.27		
C	0.15		
D	0.27		

Question 20

Option	Prop.	Key	Comments
A	0.21	A	The item was poorly done. Most of the candidates were not able to factorise with a negative operator, they went for option B.
B	0.45		
C	0.15		
D	0.19		

Question 21

Option	Prop.	Key	Comments
A	0.35	C	Candidates performed poorly in this question, may be candidates failed to identify that these are similar triangles with the ratio 1 to 2. A lot of the candidates went for option A.
B	0.17		
C	0.25		
D	0.23		



Question 22

Option	Prop.	Key	Comments
A	0.23	D	Candidates performed poorly in this question with the answer attracting the least proportion. Candidates could not factor out -1 and cancel the factor. So, a lot of them went for option B.
B	0.31		
C	0.25		
D	0.22		

Question 23

Option	Prop.	Key	Comments
A	0.26	C	Candidates performed poorly in this question. Looks like use of directed numbers was a challenge for the candidates.
B	0.23		
C	0.36		
D	0.15		

Question 24

Option	Prop.	Key	Comments
A	0.29	B	Candidates performed poorly in this item, a lot of candidates found the mean of patients arriving at the clinic every hour, there chose option A.
B	0.25		
C	0.23		
D	0.23		

Question 25

Option	Prop.	Key	Comments
A	0.24	A	This item was poorly done. The candidates showed inability to add directed numbers.
B	0.27		
C	0.24		
D	0.25		

Question 26

Option	Prop.	Key	Comments
A	0.24	C	Candidates performed poorly in this question, about a quarter of them got the question correct, others used a wrong formula.
B	0.25		
C	0.27		
D	0.24		

Question 27

Option	Prop.	Key	Comments
A	0.16	B	The performance of candidates in this question was very poor. Only 17% of them got it correct. Candidates failed to find the perimeter of the compound shape.
B	0.17		
C	0.25		
D	0.42		



Question 28

Option	Prop.	Key	Comments
A	0.26	D	Candidates performed very poorly in this question, a most of them used wrong formulas like πrh where r is the radius and h is the hight of the cylinder. A lot them used the formula for a circle (πr^2) and therefore went for option C.
B	0.42		
C	0.20		
D	0.13		

Question 29

Option	Prop.	Key	Comments
A	0.30	B	Candidates performed poorly in this question, a lot of them did not divide by 2 to get the correct answer and went for option A.
B	0.34		
C	0.18		
D	0.19		

Question 30

Option	Prop.	Key	Comments
A	0.44	C	Candidates performed very poorly in this question. Most of the candidates just subtracted the given times without taking into consideration the fact that its different days and different time zones. As a result, they went for option A.
B	0.16		
C	0.18		
D	0.23		

Question 31

Option	Prop.	Key	Comments
A	0.32	B	The performance of candidates in this question was poor. Most of them did not use the sum of angles in a pentagon (540°) to calculate angle y.
B	0.30		
C	0.30		
D	0.08		

Question 32

Option	Prop.	Key	Comments
A	0.47	D	Candidates performed poorly in this question. Most of the candidates treated this question like the normal ratio of lengths and went for option A. Very few were able to calculate volume using ratio of lengths.
B	0.23		
C	0.15		
D	0.14		

Question 33

Option	Prop.	Key	Comments
A	0.18	D	Candidates performed very poorly in this question, most of them did not use the information given to find out how many hotels are rated below 4 stars. They used the total number of hotels (41) and therefore went for option C and A.
B	0.16		
C	0.42		
D	0.25		



Question 34

Option	Prop.	Key	Comments
A	0.09	B	Candidates performed very poorly in this question, most of them did not use the frequency(number of hotels) to find the median, they just arranged the star ratings and since the middle rating is 3 they went for option C.
B	0.12		
C	0.67		
D	0.12		

Question 35

Option	Prop.	Key	Comments
A	0.37	B	The performance of candidates was very poor. They failed to calculate the area of a trapezium.
B	0.31		
C	0.15		
D	0.17		

Question 36

Option	Prop.	Key	Comments
A	0.15	A	Candidates performed very poorly in this question. The answer attracted the lowest proportion of candidates. They failed to divide numbers written in standard form.
B	0.29		
C	0.24		
D	0.32		

Question 37

Option	Prop.	Key	Comments
A	0.31	D	Candidates performed poorly in this question. They failed to identify congruent triangles.
B	0.13		
C	0.21		
D	0.35		

Question 38

Option	Prop.	Key	Comments
A	0.36	B	Candidates performed poorly in this question but most of them failed to read values from the distance-time graph.
B	0.37		
C	0.16		
D	0.10		

Question 39

Option	Prop.	Key	Comments
A	0.13	D	Candidates performed poorly in this question; they failed to calculate average speed getting readings from the distance-time graph.
B	0.21		
C	0.40		
D	0.25		



Question 40

Option	Prop.	Key	Comments
A	0.28	A	The performance of candidates in this question was poor, most of them failed to choose the correct frequency polygon.
B	0.21		
C	0.24		
D	0.28		



PAPER 2: SHORT ANSWER AND STRUCTURED

General Comments

The 2025 performance of candidates in Mathematics Paper 2 was lower than what was expected. The most worrying scenario was that some candidates used wrong methods for some questions, while others did not attempt some questions. It is clear that candidates lack algebraic and problem solving skills. Questions that dealt with drawings were the most poorly done, candidates used free hand instead of rulers and vice versa.

Comments on Individual Questions

Section A

Candidates performed poorly in this section. Some of the candidates clearly demonstrated lack of basic computational and algebraic skills.

- 1 The question was poorly done. Most of the candidates failed to collect the like terms due to incorrect sign handling. Common responses $-5g + 9h, -g - 9h, 8gh$ and $1g + 1h$.

Answer: $9h - g$

- 2 The question poorly done. Most of the candidates prematurely rounded off $\sqrt{3}$ and $\sqrt{5}$, they did not take the denominator as a single term. Common wrong answers: 38.7, 35.3, 35.5 and 35

Answer: 37.5

- 3 The question was poorly done. Most of the candidates did not divide the whole bracket by 3, they divided only T by 3, and others were not able to change the sign correctly. The common answers: $3n = T - 7$, $n = \frac{T-7}{-3}$, $n = 3T + 7$ were due to wrong order of operations.

Answer: $n = \frac{T+7}{3}$

- 4 It was poorly done because candidates were not able to subtract 10 both side correctly and their common answers were: $5x = 4$, $15x = 6$ and $2x + 3x = 16$.

Answer: $x = -\frac{4}{5}$ or $x = -0.8$

- 5 The question was poorly done, candidates ignored the need for a common denominator, incorrect handling of the negative signs and poor usage of brackets. $-4(p - 1) = -4p - 1$ instead of $-4(p - 1) = -4p + 4$, cancelled terms across addition: $\frac{5p+15}{p+3} \rightarrow 5$

Answer: $\frac{p+19}{(p-1)(p+3)}$



- 6 The question was poorly done with most of the candidates having $3(x^2 - 9)$ although correct but not fully factorised and some gave $3x(x - 9)$ which when expanded will introduce an extra x term.

Answer: $3(x - 3)(x + 3)$

- 7 The question was fairly done as some candidates were able to construct the triangle correctly showing the construction arcs, others drew a triangle with wrong measurements for some sides and yet others used free hand.

- 8 The question was poorly done. Most of the candidates were not able to eliminate one variable correctly. The common wrong approaches were: $(2x - 3y = 7) + (2x + y = 11) \Rightarrow 4x - 2y = 8$ wrong. Common mistake: $4y = -4 \Rightarrow y = -1$

Answer: $x = 5$ and $y = 1$

- 9 The question was poorly done. Most of the candidates failed to identify the correct angle and the correct trigonometric ratios to apply.

Answer: 32.0 m

- 10 The question was poorly done. The question was testing the understanding of midpoint, the common errors were: $3 + x = -4$ failing to divide by 2, $\frac{3x}{2} = -4$ multiplying instead of adding and $\frac{-2+12}{2} = -4$ that is mixing up of x and y coordinates.

Answer: $x = -11$

- 11 The question was poorly done. Most of the candidates failed to expand correctly and those who attempted to expand had common errors like:

- $5x^2 + 6$: failing to multiply all terms.
- $5x^2 + 10x - 6$: use of incorrect signs.
- $5x^2 - 10x - 3x + 6$: failing to collect like terms.

Answer: $5x^2 - 13x + 6$

- 12 (a) The question was well done. Most of the candidates were able to draw the line $y = 1$ although some drew a short line, not intersecting with the quadratic graph or using free hand or dotted lines. Only a few failed to draw the line $y = 1$ instead they drew $x = 1$ or $y = -1$.

Answer: Correct line $y = 1$ drawn

- (b) The question was poorly done. Most candidates failed to identify the correct values of x even where they drew the correct line $y = 1$ due to failure to read what each small division represented on the graph.

Answer: $x = -0.4 \mp 0.1$ or $x = 5.3 \mp 1$



- 13 (a) The part question was poorly done. Most of the candidates treated a horizontal segment (Q and R) as movement instead of recognising it as a stationary period, no movement. Others wrote the journey/distance was constant.
- (b) The part question was poorly done. Most of the candidates mixed up the segments with the steepest slope and assuming the longest segment implies the fastest speed.

Section B

Again the performance of candidates in this section was unsatisfactory.

- 14 (a) The question was fairly done. Some candidates misread 56 000 for 5 600, others expressed their answers as 39.200.

Answer: P39 200

- (b) The question was poorly done. Majority of the candidates calculated total instalments correctly and gave it as their final answer without adding the deposit.

Answer: P64 400

- (c) The part question was poorly done. Most of the candidates swapped the numerator with denominator. Common responses were 11.5%, 87.5%.

Answer: 115%

- (d) The question was poorly done as most candidates divided $\frac{106\,000}{0.092}$ instead of multiplying because they mismatched the ratio components.

Answer: P9 752

- 15 (a) The part question was poorly done. Most of the candidates were able to state the correct transformation but failed to describe it fully. They misinterpreted the scale factor missing the inversion or rotation. Some candidates wrote reduction as the transformation.

Answer: Enlargement, centre (4, -1) scale factor $-\frac{1}{2}$

- (b) The question was well done. Most of the candidates were able to reflect the object correctly. Only a few reflected on the wrong axis.

Answer: correctly drawn triangle (-2, 1), (-2, 7) and (-4, 7)

- 16 (a) The part question was poorly done. Most of the candidates failed to identify the properties of an isosceles triangle. Some added the given angle 57° and 48° .

Answer: 84°

- (b) The part question was poorly done. Candidates added or subtracted 180° incorrectly for back bearing and they failed to figure out the correct direction for the bearing from the north line at P. Common response: $180^\circ - 57^\circ = 123^\circ$.

Answer: 237

- (c) It was poorly done. Most of the candidates failed to apply the correct trigonometric ratio or midpoint theorem properly. Common error was $PS = 25 \times \tan 38^\circ$.

Answer: 639 m

- 17 (a) The part question was well done. Candidates were able to identify the common difference and generated the sequence correctly.

Answer: 34

- (b) This part question was poorly done. Some of the candidates gave the rule in words (add 7). Common answers: $n + 7$, $n^{\text{th}} + 7$ and $7n$.

Answer: $T_n = 7n - 1$

- (c) The part question was fairly done. Some of the candidates were either able to substitute 105 or -1 in their rule.

Answer: 734

- 18 (a) The part question was poorly done. Most of the candidates gave the common response as triangular prism.

Answer: Triangle

- (b) The part question was poorly done. Most of the candidates failed to apply Pythagoras rule correctly.

Answer: $7.5^2 = 6.9^2 + x^2$

$x = 2.94$

- (c) The part question was poorly done. Most of the candidates used the formula: $V = lbh$ instead of $V = \frac{1}{2}lbh$ and they failed to round off correctly.

Answer: Volume = $\frac{1}{2} \times 6.9 \times 2.94 \times 12 \frac{1}{2}$

121.7



- 19 (a) (i) The part question was well done. Most of the candidates correctly calculated the sector angles. A few of the candidates failed to get the correct total number of children leading to wrong sector angles.

Answer:

Type of crime	Sector angles
Defilement	96°
murder	36°
Neglect	144°
Others	84°

- (ii) The part question was fairly done. Some of the candidates failed to use the protractors correctly to share the 360° according to the angles.
- (b) The part question was poorly done. Most of the candidates multiplied 120 by 13 and divided by 360°.

Answer: $\frac{13 \times 360}{120}$

39

- 20 (a) The part question was poorly done. Most of the candidates divided 0.954 by the radius 0.45, they failed to make h the subject of the formula and failed to square the radius. Others failed to round off to 3 significant figures.

Answer: $\frac{0.954}{\pi \times 0.45^2} = 1.50$

- (b) The part question was poorly done. Most of the candidates calculated the total surface area instead of the curved surface area.

Answer: $2 \times \pi \times 0.45 \times 1.50 = 4.24$

- 21 (a) The part question was fairly done. Some of the candidates were able to interpret the graph correctly by finding the correct position on the x-axis and extrapolate on the graph to find the answer on the y-axis. Other common answers given were 4 and 7 which were incorrect.

Answer: 1 to 3

- (b) The part question was poorly done. Most of the candidates managed to identify the median position through calculations but failed to interpret the scale on the x-axis after extrapolating correctly even though others read from the wrong axis.

Answer: 40

- (c) The part question was poorly done. Most of the candidates calculated the position of 80th percentile of 300 correctly but did not use the graph to read the corresponding age.

Answer: 48 to 49

Section C

The performance of candidates in this section was far from satisfactory. Most of the candidates lack problem solving skills.

- 22 Candidates performed poorly in this question. Most of the candidates did not attempt the question. Those who attempted used random numbers adding to 1000 without using digit 8. Some candidates multiplied the numbers to get 1000 instead of adding.

Answer: $888 + 88 + 8 + 8 + 8$

- 23 The performance of candidates was poor. Most of the candidates managed to divide 80 by 16.20 but failed to multiply by 12 to get number of eggs. Some of the candidates calculated the price and got P81 but failed to find the corresponding number of eggs.

Answer: 59

- 24 Candidates performed fairly in this question. Some of the candidates just listed the values of each letter instead of writing the required three-digit number. Some failed to interpret the phrases; '4 times bigger', for $4M$ and ignored $K \neq 0$.

Answer: 182

- 25 The question was poorly done. Most of the candidates did not attempt the question, whilst others assumed that the small and big boxes can be mixed in the same container instead of choosing 10 small or 8 large per container.

Answer: 11

- 26 The question was poorly done. Most of the candidates just added 31 and 16 (product of 8 by 2) and got 47 as the answer which was an incorrect relationship between Kevin and his father's speed.

Answer: 46

- 27 The question was poorly done. Most of the candidates failed to form the correct linear equation from the statement given and incorrectly confused "five less" with "five more than". Those who managed to form the equation failed to multiply every term by 3 to clear the fraction.

Answer: $(N) = 3$



28 The question was fairly done. Some of the candidates managed to correctly place at least 2 values.

Answer: 4, 8, 12
4, 10, 16
4, 14, 24
12, 14, 16

29 The question was fairly done. Most of the candidates managed to sub-divide the shape into at least one required rectangle.