EXAMINATIONS COUNCIL OF ESWATINI

JC

EXAMINATION REPORT

FOR

MATHEMATICS

YEAR

2022

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JC Mathematics

Paper 309/01

General comments

The overall performance of the 2022 candidature saw a drop when compared with the previous year. There were comparatively numerous candidates who obtained a total score of zero in this year's examination. It could be ascertained that the main problem with most of the candidates was content-oriented. A relatively larger proportion of the cohort of candidates showed lack of competence in the subject matter.

Comments on specific questions

1. **(a)** Work out

(i) 1.5×2.31 [2]

(ii) $\frac{501}{0.5}$ [2]

(b) Write 560 g as a percentage of 2000g. [2]

Correct answers

(a) **(i)** 3.465

(ii) 1002

(b) 28

Comments

(a) (i) Performance in this sub-question was below average. Most candidates were able to multiply the decimal numbers correctly but then mis-located the decimal point in the answer (i.e. 34.65, 346.5, 3465). As a result, the candidates were losing the accuramark.

(ii) This sub-question was not well done. A larger proportion of the cohort was unable to divide by a decimal number. Among them were candidates who attempted dividing the numbers without making an equivalent expression with a whole number divisor. There were also some candidates who only multiplied the divisor by 10 leaving the dividend as it is (i.e. $\frac{501}{0.5\times10}$) thus yielding an incorrect answer. On another note, there were candidates who managed to form an equivalent expression with a whole number divisor (i.e. $\frac{5010}{5}$), but failed to divide correctly thus losing the accuracy mark.

Common wrong answers included: 102, 10.02, 100.2.

(b) Performance in this question fairly good. Most of the candidates were getting the correct answer. However, some candidates could not obtain the correct answer, 28, from the correct method; $\frac{560}{2000} \times 100$. There were also candidates who confused the method and had either $\frac{2000}{560} \times 100$ or $\frac{560}{100} \times 2000$.

Common wrong answers included: 2.8, 56, 112

2. **(a)** Round off 399.9584 to

(i) Four significant figures [1]

(ii) Two decimal places. [1]

(b) (i) Express 0.0000201, in standard form [1]

(ii) Evaluate $2^2 \times 8^{-2}$ [2]

Correct answers

2 (a) (i) 400.0

(ii) 399.96

(b) (i) 2.01×10^{-5}

(ii) $\frac{1}{16}$

Comments

(a) (i) Most candidates were getting this part question wrong.
Common wrong answers included: 400; 400.0000; 399.0

(ii) This sub-question was fairly done by the cohort. A relatively large proportion of the candidates were getting the correct answer.

Common wrong answers included: 399.9600; 399.95

(b) (i) Most of the candidates were failing to write the given number correctly in standard form. Some of those who seemed to have the correct idea of standard form had 10 raised to a positive index.

Common wrong answers included: 2.01×10^5; 2.01×10^7 ; 201×10^5

(ii) Very few candidates manages to get this part question correct. The majority of the candidates did not succeed in trying to deal with the negative index.

Common wrong answers included: 64; 16^{-4} ; 16^2 ; $\frac{1}{64}$

3. Given that $x = 4$, $y = -3$ and $z = -\frac{3}{5}$,
Find the value of
(a) $x^2 - y^2$ [2]
(b) $\frac{y}{z}$ [1]

Correct answers

(a) 7
(b) 5

Comments

(a) Most candidates were getting the correct answer. However, there were candidates who had the correct substitution but then their answers became incorrect perhaps because they did not square the negative to obtain a positive (i.e. writing -3^2 instead of $(-3)^2$). Some candidates were leaving out the indices and ended up having 4 – – 3 and there were also those who treated squaring as multiplication by 2 (i.e. 8 – 6).
Common wrong answers included: 25; 7; 2

(b) Most candidates failed to obtain the correct answer in this part question. Most of them could substitute in the fraction but eventually failed to divide by the fraction (i.e had $\frac{-3}{\frac{-3}{5}}$ but nothing correct followed). On another note, there were candidates who did multiply the numerator by the reciprocal of the denominator but losing the negative sign resulting to an incorrect answer (i.e. $-3 \times \frac{5}{3}$).

Common wrong answers included: – 5; $\frac{-1}{5}$

4. The table below shows the number of loaves of bread sold in one particular shop.

Day	Monday	Tuesday	Wednesday
No. of loaves	200	250	

(a) Calculate the percentage increase in the number of loaves sold between Monday and Tuesday. [2]

(b) A 10% decrease in the number of loaves sold is predicted between Tuesday and Wednesday. Calculate the number of loaves sold on Wednesday. [2]

Correct answers

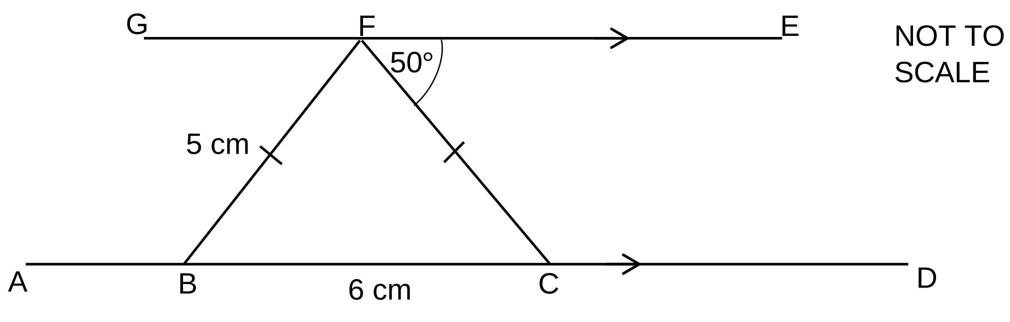
(a) 25
(b) 225

Comments

(a) Candidates fairly responded well to this sub-question. A sizeable number of candidates were getting the correct answer. However, some candidates missed the answer even when their method was correct (i.e. $\frac{50}{200} \times 100$ but incorrect answer). There were also candidates who confused the method from the beginning and obviously came up with wrong answers (i.e. $\frac{50}{250} \times 100$; $\frac{50}{450} \times 100$; $\frac{250}{200} \times 100$; $\frac{250}{100} \times 200$).
Common errors included: 50; 20.

(b) This sub question was not well done by the candidates. However, most of the learners were able to work out the 10 % decrease in the number of loaves of bread sold but then ended up not subtracting the 10% from the 100%. Some candidates added the 10 % as if it was an increase.
Common writing answers included: 25, 275

5. The diagram shows two parallel lines GFE and ABCD.
CF and BF are cutting lines such that CBF is a triangle.
BF = CF, BC = 6 cm and BF = 5 cm and $C\hat{F}E$ = 50°



(a) Write down the name given to triangle BCF, [1]

(b) Write down the size of $B\hat{C}F$ [1]

(c) Find $C\hat{F}B$ G [2]

(d) Calculate the perpendicular distance from BC to F. [3]

Correct answers

(a) Isosceles
(b) 50
(c) 80
(d) 4

Comments

(a) Most candidates were getting this sub-question correct except that a majority of the candidates could not spell 'isosceles' correctly.
Common wrong answers included: scalene; equilateral

(b) A relatively large proportion of the cohort got this sub-question correct.
Common wrong answer was 60°

(c) This sub-question was fairly done. A considerable number of candidates were able to get the correct answer. Some candidates were getting wrong answers due to the use of an incorrect answer to part (b).
Common wrong answers included: 50° ; 60° ; 130°

(d) Performance in this sub-question was bad. Very few candidates managed to get the correct answer. Apparently, candidates did not see the applicability of Pythagoras' theorem in the question and so whatever they had written was far from being correct.

6. Solve
(a) $3 - 4m \geq 9 - m$ [2]
(b) $2y - 5 = \frac{y}{3}$ [3]

Correct answers

(a) $m \leq -2$
(b) 3

Comments

(a) Performance on this sub-question was below average. Most candidates were failing to collect like terms to the same side of the inequality sign. Some candidates were replacing the inequality sign with an equality sign rendering the whole statement incorrect. There were also candidates who failed to properly change the inequality sign when it was necessary and hence their answer had an inverted inequality sign.
Common wrong answers included: $m \geq -2$; $m = -2$: $m \leq 2$.

(b) Performance in this sub-question was below average. A majority of the candidates were failing to clear the fraction in the equation properly. Most of them would not multiply the -5 by the denominator and/or obtain $3y$ on the right hand side instead of just y (i.e. $6y - 5 = 3y$). There were also some candidates who were not able to rearrange the terms to bring like terms to the same side of the equal sign.
Common wrong answers included: $y = 5$; $y = 1$; $y = -5$

7. **(a)** On a particular day in Mbabane, the minimum temperature recorded was –2 ℃.
The maximum temperature was 18℃.
Work out the difference between these two temperatures. [2]

(b) Estimate $\frac{165.274}{1.692}$, correct to one significant figure. [2]

Correct answers

(a) 20
(b) 100

Comments

(a) This sub-question was fairly done. Most candidates realized that two temperatures had to be subtracted, but some of them failed to successfully subtract the directed numbers. (i.e. 18 – – 2 = 16 ; – 2 – 18 = – 20).

(b) Most candidates failed to find an estimate of the given numerical expression. Some of the candidates did realise that they had to round off each of the numbers to one significant figure, however, their attempt was incorrect. There were also candidates who did not have the idea of rounding off first but attempted dividing the numbers as they were.

8. Given that A = $\begin{pmatrix} 3 & -1 \\ -2 & 1 \end{pmatrix}$, B = $\begin{pmatrix} 0 \\ -1 \\ 8 \end{pmatrix}$ and C = $\begin{pmatrix} -7 & 4 \\ 5 & 6 \end{pmatrix}$

(a) State the order of matrix B. [1]

(b) Work out

(i) A + C [2]

(ii) – 3B [2]

Correct answers

(a) 3 × 1

(b) (i) $\begin{pmatrix} -4 & 3 \\ 3 & 7 \end{pmatrix}$

(ii) $\begin{pmatrix} 0 \\ 3 \\ -24 \end{pmatrix}$

Comments

(a) The majority of the candidates were able to write the order of the matrix correctly. There were only few candidates who interchanged the number of rows and the number of columns in the order, thus having the answer as 1 by 3.

(b) (i) This sub-question was fairly done. A good number of candidates were able to add the 2 by 2 matrices. Having said that, there were also candidates who apparently, had difficulty adding numbers involving negatives.

Common wrong answers included: $\begin{pmatrix} 10 & 3 \\ 3 & 7 \end{pmatrix}$; $\begin{pmatrix} -10 & 3 \\ 3 & 7 \end{pmatrix}$; $\begin{pmatrix} -4 & -3 \\ -3 & 7 \end{pmatrix}$

(ii) Most candidates were able to get the correct answer to this sub-question. Some candidates were having a challenge with multiplying by negative numbers.

Common wrong answers included: $\begin{pmatrix} 0 \\ -3 \\ 24 \end{pmatrix}$; $\begin{pmatrix} -0 \\ 3 \\ -24 \end{pmatrix}$

9. (a) Remove the brackets and collect like terms

$5 + 3\,(2n - 4) - n$ [2]

(b) Simplify $\frac{3t}{4} - \frac{5-2t}{2}$ [3]

Correct answers

(a) $5n - 7$

(b) $\frac{7t-10}{4}$

Comments

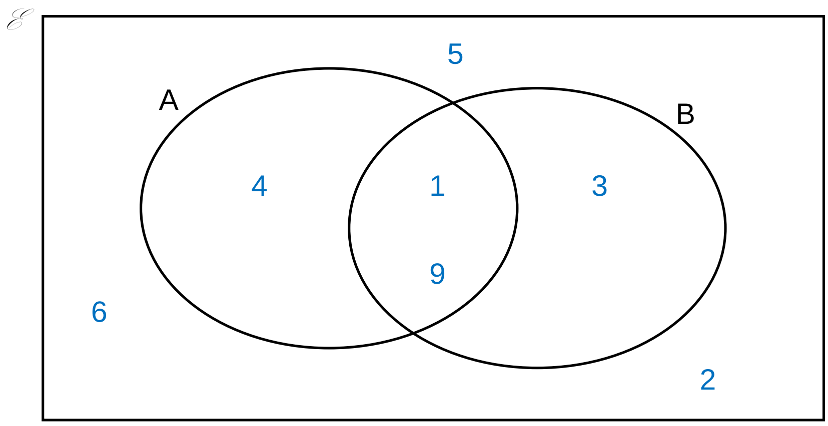
(a) Most candidates got this one correct. Some of those who failed this sub-question proved to have little or no command of the order of operations (i.e. started with adding 5 to 3 instead of removing the brackets). Some candidates removed the brackets first but then failed to collect the like terms.
Common errors included: 8(2n – 4) – n ; 5 + 6n – 12 – 3n ; 5$n \pm$ 17

(b) This sub-question was also not well done by most of the candidates. Some candidates were using 8 as a common denominator and hence their answers were left unsimplified. There were also candidates who totally cancelled the denominators in the fractions and hence their answers ended up not having denominators. There were also candidates who had the correct method but failed to collect like terms in the numerator. Common wrong answers included: $\frac{14t-20}{8}$; $\frac{\pm t-10}{4}$

10. Describe fully the locus of a point that is always 5 cm from a point P. [3]
Correct answer
Circle of radius 5 cm and centre P
Comments
The majority of the candidates were failing to describe the required locus.

11. Given
ξ = {1, 2, 3, 4, 5, 6, 9}
A = {Square numbers}
B = {Factors of 9}

(a) List the elements of A. [2]
(b) Show the information on the Venn diagram. [3]



[3]
(c) Write down, n(A ∪ B) [1]

Correct answers

(a) 1, 4, 9
(b) Inscribed in Venn diagram
(c) 4

Comments

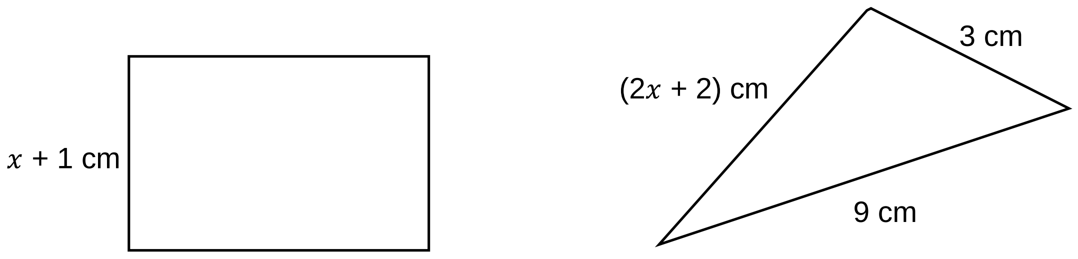
(a) This sub-question was fairly the candidates. Seemingly, some candidates were not aware that 1 is a square number. A few candidates would include elements outside the universal set in their answer. Common wrong answers included: {4, 9} ; {2, 4, 6}

(b) Performance in this sub-question was not good. Most of the candidates were not able to place the elements in the correct region. Perhaps, the candidates could not ascribe each of the elements to the correct set and hence it was not possible to complete the Venn diagram accurately.

(c) Most candidates were listing elements instead of writing the number of elements in the set. Some candidates were putting the correct answer inside set brackets thus making the response inappropriate i.e {4}.

12. The figure below shows a rectangle and a triangle.
The length of the rectangle is $(4x - 2)$ cm and the width is $(x + 1)$ cm.
The dimensions of the triangle are 3 cm, 9 cm and $(2x + 2)$ cm.
Both shapes have the same perimeter.

NOT TO SCALE



(a) Write down an expression for the perimeter of the rectangle, in its simplest form. [2]

(b) (i) Form an equation in x, relating the perimeters of the two shapes. [2]

(ii) Solve for x in *(b)*(i). [2]

(c) Calculate the area of the rectangle. [2]

Correct answers

(a) $10x - 2$

(b) (i) $10x - 2 = 9 + 3 + (2x + 2)$

(ii) $x = 2$

(b) 18 cm^2.

Comments

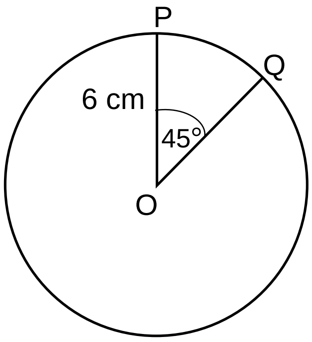
(a) Very few candidates were able to demonstrate understanding of perimeter. The majority of the candidates were writing incorrect expressions. Some of them presented a product of the expressions for length and breadth (i.e. $(4x - 2)(x + 1)$). Other candidates were adding the length and the breadth for the rectangle (i.e. $4x - 2 + x + 1$).

(b) (i) A relatively large number of candidates failed to correctly equate the perimeters for the two polygons. Some of the candidates would equate their incorrect expressions of the perimeter of the rectangle to that of the triangle (i.e. $4x - 2 + x +1 = 9 + 3 + 2x + 2$). Other candidates were writing expressions instead of equations as per the requirements of the question.

(ii) Most of the candidates subsequently got this sub-question wrong since they had incorrect responses in (b) (i).

(b) Performance in this part question was bad. Most candidates got it wrong probably because it was dependent of the answer to (b)(ii). It was also apparent that some candidates did not know the formula for the area of a rectangle.

13. The figure shows a circle, centre O.
The circle has a radius of 6 cm and a sector angle of 45°.



NOT TO SCALE

Calculate

(a) the circumference of the circle. [2]

(b) the area of the minor sector POQ. [3]

Correct answers

(a) 37.68

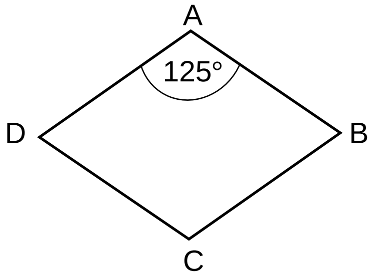
(b) 14.13

Comments

(a) There were very few candidates who managed to get this part question correct. Most of the candidates seemed to have forgotten the value of π. Some of the candidates demonstrated not to have knowledge of the calculation of the length of circumference. Other candidates were calculating area instead of the length of circumference (i.e. $3.14 \times 6 \times 6$). There were also few candidates who had the correct method but obtained wrong answers from their working.

(b) Most of the candidates could not recall the formula for the area of a sector. Common errors included: 3.14×6^2 ; $\frac{45}{360} \times 3.14 \times 12$.

14. The diagram below shows a rhombus ABCD.
$B\hat{A}D$ = 125°.



NOT TO SCALE

(a) State the order of rotational symmetry of the rhombus. [1]

(b) Calculate angle ADC. [2]

Correct answers

(a) 2

(b) 55

Comments

(a) A fairly good number of candidates got this part question correct. However, a considerable number of the candidates confused rotational symmetry with line symmetry. Common errors included: 2 lines of symmetry; order 4

(b) Most of the candidates were able to get the correct answer to this part question. Common errors included: 360° – 125° ; 360° – 250°.

15. The distribution shows the minimum temperatures recorded in winter for a particular town.
– 6, 5, 4, – 3, 10, 8, – 11

(a) Find the median minimum temperature [2]

(b) Calculate the mean minimum temperature. [2]

Correct answers

(a) 4
(b) 1

Comments

(a) A relatively large number of candidates failed to find the median for the list of numbers. Some of the candidates just picked the middle number without arranging the numbers in order of size (e.g. – 3) . There were some candidates who did recall that they needed to arrange the numbers in order of size, but failed due to that fact that some of the numbers were negative.

(b) This part question was poorly performed by the candidates. The majority of the candidates had a challenge with adding the numbers especially because they involved negative numbers. Common wrong answers included: 7, $\frac{-47}{7}$, – 47

16. (a) A bus leaves Manzini at 2:35 pm and reaches Nhlangano at 4:30 pm.
Calculate the time taken by the bus to travel from Manzini to Nhlangano. [2]

(b) A car travelling at an average speed of 120 km/hr takes 1 hour 30 minutes to reach its destination.

Calculate the distance covered by the car.

Correct answers

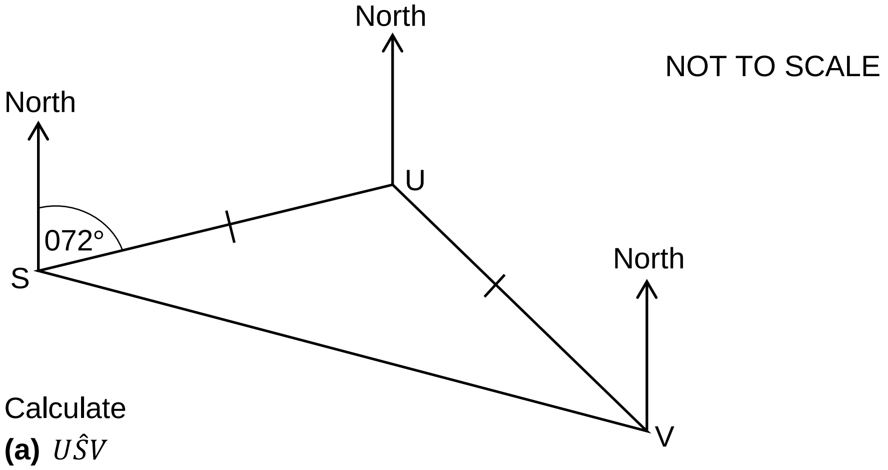
(a) 1 hour 55 minutes
(b) 180

Comments

(a) Performance in this part question was fair. A sizeable number of candidates were able to get the correct answer. However, some candidates subtracted the time as if it was part of the decimal system of numbers and thus their answers were incorrect. Common wrong answers included: 1 : 95 ; 2 : 05

(b) A relatively large proportion of the candidates were failing to convert 1 hour 30 minutes to hours and hence got wrong answers. Some candidates were dividing the speed by the time instead of multiplying. Common errors included: 120 × 90 ; 120 × 1:30 ; $\frac{120}{1.5}$

17. The bearing of U from S is 072°.
The bearing of V from S is 112°.
SU = UV



Calculate

(a) $U\hat{S}V$ [2]

(b) The bearing of V from U. [3]

Correct answers

(a) 40

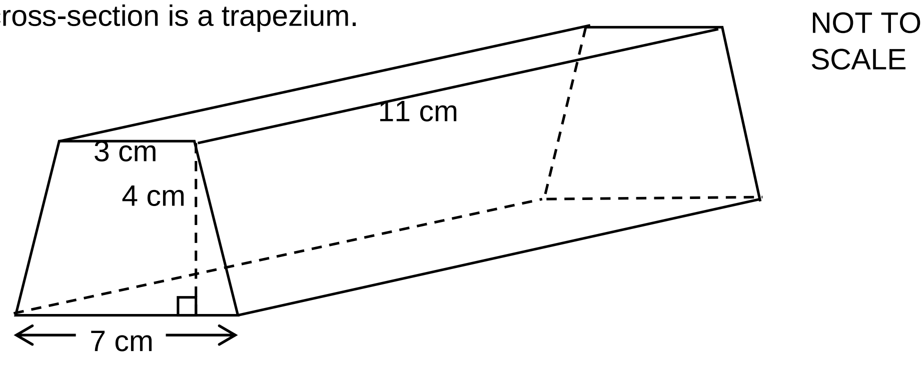
(b) 152

Comments

(a) Performance in this part question was average. A sizeable number of candidates were able to get the correct answer. Common errors included: 180° – 72° ; 180° – 112°.

(b) Very few candidates were able to get this part question correct. Responses to this question were haphazard and hence it could not be ascertained whether candidates were able to identify the required bearing or not.

18. The diagram below shows a prism.
The cross-section is a trapezium.



Calculate the volume of the prism. [3]

Correct answers

220

Comments

There were very few candidates who got this question correct. Some candidates did not know how to calculate the volume of a prism. Others had a challenge with the area of the trapezium cross-section and so their answers were incorrect. Common errors included: $7 \times 4 \times 3 \times 11$; $\frac{1}{2} \times 4\ (7 + 3)$

19. (a) Write down the name of a seven-sided polygon. [1]

(b) Calculate the size of each interior angle of a 24-sided regular polygon. [2]

Correct answers

(a) Heptagon
(b) 165

Comments

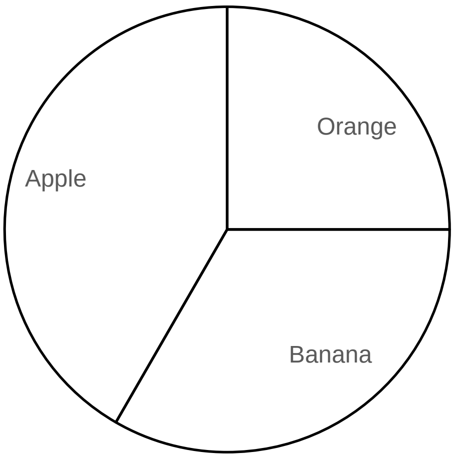
(a) This part question was fairly done. A fairly large number of the candidates were able to write the name of a seven-sided polygon. However, some candidates were failing to write the correct spelling for the seven-sided polygon. Common wrong answers included: hectagon; hectorgon; hexagon

(b) Most candidates failed to get the correct answer. Some candidates attempted finding the sum of interior angles for a 24-sided polygon and never divided the sum by 24. Other candidates only found the size of one exterior angle of the regular polygon. Common errors included: (24 – 2) $\times 160°$; $\frac{360}{24}$

20. The table below shows the favourite fruits of 60 learners in a class.

Fruit	Number of learners
Banana	20
Apple	25
Orange	15

(a) Complete the pie chart to show this information. [4]
[*Only the sector for orange was given in the question*]



(b) A learner is chosen at random from the class.
Find the probability that the learner likes banana or apple. [2]

Correct answers

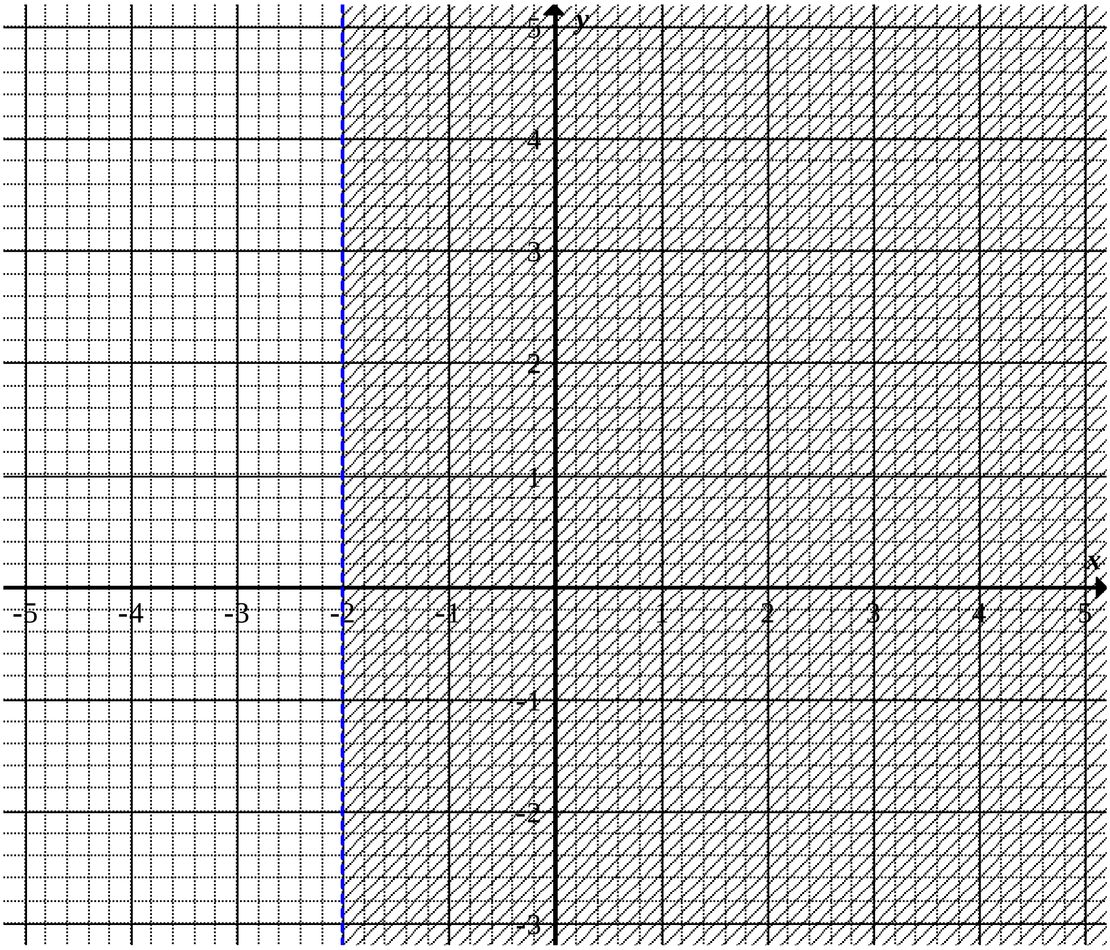
(a) Correct calculation of 120 or 150 and accurately drawn sectors as shown in the pie chart above.
(b) $\frac{45}{60}$

Comments

(a) This part question was fairly done. A sizeable number of candidates had the correct sectors in the pie chart even when their working was not seen thus losing the 2 marks for calculating the sector angles. Some candidates had a wrong method for calculating the sector angles (i.e. $\frac{20}{60} \times 180°$; $\frac{25}{100} \times 360°$)

(b) A fairly large number of candidates were able to get the correct answer. Some candidates did not combine the probabilities for choosing a learner who liked banana and choosing one who liked apples and hence their answers were incorrect. Common wrong answers include: $\frac{20}{60}$; $\frac{25}{60}$; $\frac{20}{60}$ or $\frac{25}{60}$

21. (a) Show the inequality $x > -2$ on the grid, by shading. [2]



(b) Find the image of the point (1, 1) after a rotation, centre (– 1, 4) through – 90°, using the grid above. [2]

Correct answers

(a) Shown on the grid

(b) (– 4, 2)

Comments

(a) Very few candidates got this part question correct. Common errors included: a solid boundary line; shading wrong region; shading correct region partially; drawing wrong line (i.e. y = – 2)

(b) The majority of the candidates failed to rotate the given point correctly. Some candidates apparently found the image but failed to write its coordinates correctly (i.e. (4, 2) ; (4, – 2)).

Paper 309/02

General comments.

The paper was found to be challenging by the candidates, yet it was addressing the usual content areas that are examined yearly. The candidates seemed to have expected other content to be examined. This was seen when the responses given were not in the expected format: for example, in question 5(a)many candidates listed the balls in the bag that were labelled with even numbers instead of giving the probability of picking these – Candidates were expecting a question where Candidates would be asked to list elements of a set; Candidates also expected to be asked a question which would require them to use the formulae for area or volume of a circle, hence in answering **question 7** Candidates would use the formulae, sometimes cancelling correct working.

The candidates had enough time to write as they would be found cancelling a lot. At the same time many candidates left blank answer spaces if they could not give a correct answer.

The paper had some easy questions which were answered correctly by most candidates – **1(a), 2** and **6**. There were questions which also proved difficult for the candidates, **1(d), 7(c)** and particularly **Q10** which had wrong responses from almost all the candidates.

A common error was failure to interpret percentages correctly in Q1 and Q6. Candidates used the quantity as the denominator and multiplied by 100 instead of the opposite, that is 20% of 30 would be evaluated as $\frac{20}{30} \times 100$ instead of $\frac{20}{100} \times 30$.

Comments on specific questions

Question 1

(a) Most Candidate included units in ratios, and they lost marks in the simplification part. Most candidates would write 666:333 and 666:333:1 Some answers were $\frac{1}{2}$ or $\frac{333}{666}$. Fractions were used as ratio.

(b) **(i)** Candidates had difficulty in dividing whole numbers by a whole number.
(ii) Candidates had difficulty changing the litres in **(b)(i)** to millitres, hence were wrong.

(c) Candidates calculated 30% of 20 but did not add the 30% to the E20. Common wrong answer was E6.

(d) (i) Most candidates failed to answer this question, Candidates had no clue how to answer or tackle this question. This was a very tricky question to candidates. A lot of answers were seen: 1:3, 1:5, 5:3, 9:15, 1:3:15. Most Candidates could not work out the correct answer. Some would leave blank spaces.

(ii) Candidates also failed to find the total number of workers since the ratio was wrong. The most common wrong answer was 54.

Solutions

(a) 1:2

(b) (i) 3

(b) (ii) 24

(c) E26

(d) (i) 9:5

(d) (ii) 34

Question 2

(a) Most candidates got this Question correct. Some candidates left it as was, or mixed labels in transformations. The lines y=0 or x=0 was not known by most candidates. A few candidates had a problem with the x and y lines.

(b) Candidates had a problem with where to start in calculating steps to take in a translation.

(c) Most candidates got the correct answer in this Question.

(d) Most candidates did not know the meaning of a negative scale factor.

(e) Candidates that recognized the transformation as a reflection would give the line of reflection as x = 2, or center 2. Candidates would mix the transformation e.g. enlargement, reflection and/or rotation. Quite a large number of candidates gave two transformations.

Solutions

(a) Triangle Q(3,1), (5,3), (5,1)

(b) Triangle R(-3,-4), (-5,-4), (-5,-2)

(c) Triangle K(3-,1), (5,-1), (5,-3)

(d) Triangle P(10,-2), (10,-6), (6,-2)

(e) Reflection, y=2

Question 3

(a) (i) Most candidates wrote equations instead of an expression. Most common wrong answer was 180 + x or x = 180 + ABC

(ii) Candidates did not know that interior + exterior is 180°. Some would write 3x = 360°, 180 + x, ABC + x = 180

(iii) Most candidates used (n-2) x 180 and they did not know the sum of interior angles. They were supposed to use the knowledge of the sum of exterior angles that it is of 360°.

(iv) Most candidates did not know how to name Polygons. They gave names such as monogon, Hectagon and hexagon as common wrong answers.

(b) (i) Most candidates wrote Square and those who wrote Quadrilateral did not write the correct spelling such as equadrilateral, quadralic.

(ii) Most got correct answers on this question. A common wrong answer was prime factor.

(iii) Most candidates wrote interior + exterior which showed that they did not know pairs of angles. A common wrong answer was ‘straight angle’.

(iii) Most candidates wrote bisecting lines instead of perpendicular lines.

Solutions

(a) (i) 180° - x

(ii) (x) = 45°

(iii) 8

(iv) Octagon

(b) (i) Quadrilateral

(ii) Prime number

(iii) Supplementary

(iv) Perpendicular

Question 4

(a) Most candidates had a difficulty with evaluating numbers raised to a power. Candidates would get 9 instead of 27 and y^6 instead or $y^{9.}$ Candidates would raise just one item to a correct index, e.g. $27xy^3$

(b) Candidates had forgotten how to evaluate a number raised to a negative power. In most cases candidates would use the power as a scalar.

(c) Most Candidates got this question correct. Most common error were due to partial factorization . Common wrong answers were 2(x + xy-2x) or 4-2.

(d) There was no multiplication of all terms by 6. They gave $6\frac{(x+1)}{2}$-(6) $\frac{x-3}{3}$=1. In addition, the removal of the denominator was a problem: $\frac{3(x+1)-2(x-3)}{6}$=6, after which the right hand side would be 36. Candidates did not multiply each term by the LCM, Candidates left the RHS as a fraction. Other candidates had a problem in multiplying a negative by a negative number such that the second bracket gave -9 as the last term, leading to a wrong answer.

(e) In this question, most candidates found the LCM of 12 but had a problem of manipulating directed numbers. Other candidates did not know what to do with the 12. Some candidates simply added the numerators to get a new numerator and also added the denominators to get a new denominator of 7.

Solutions

(a) $27x^3y^9$

(b) $\frac{16}{81}$

(c) 2x(x + y – 2)

(d) x = -3

(e) $\frac{x-25}{12}$

Question 5

(a) (i) Most candidates got this question correct. Some of those that got this question wrong would list the numbers that made up this set and equated it to 4 without expressing this as a probability of $\frac{4}{8}$.

(ii) Candidates who got this wrong wrote 2 instead of $\frac{2}{8}$, after identifying the members of this set.

(iii) This was well done since most got 0 as the probability. Candidates continued to write statements like: none, nothing, impossible instead of just giving zero.

(b) Almost all candidates got this question wrong since they wrote $\frac{10}{x}$ or $\frac{1}{x}$, or *x* instead of 1- $\frac{10}{x}$

Solutions

(a) (i) $\frac{4}{8}$

(ii) $\frac{2}{8}$

(iii) 0

(b) 1 - $\frac{10}{x}$

Question 6

(a) Most candidates correctly answered this Question. Wrong answers were due to candidates not knowing what to do with the second column on the table which had no heading. Candidates would write either tally marks or the frequencies in that column.
The common wrong answer for the frequency was that the candidates would restate 4, 5, 6, 7, 8, 9 and 10 or give cumulative frequency of correct frequencies.

(b) Most candidates answered this part correctly. Tally marks were written in the blank column. Some candidates would give the frequency of the modal mark.

(c) The candidates could find the answer in several wrong ways: Candidates added up the data values and divided by 7 to get 7; or line up the data values in order of size and found that the answer is also 7. Other common wrong answers were $\frac{29+1}{2}$ or $\frac{50+1}{2}$ as median position.

(d) Most candidates divided by 7 instead of 30. Another challenge for the candidates was evaluating values of *fx* correctly leading to wrong values of '210'. The mean could also be found by adding up the numbers 4, 5, 6, 7, 8, 9 and 10 and divided by 7 – which was the wrong method.

(e) Candidates did not know the meaning of 'at least' such that they would give the values of learners who got 8 only. Therefore, the common wrong answer was 3.

(f) Most candidates calculated the 20% of 30 but they did not subtract it from 30, 6 was a common wrong answer; some would also give 36 as an answer.

Solutions

(a) 2, 4, 6, 8, 3, 4, 3

(b) 7

(c) 7

(d) 7

(e) 10

(f) 24.

Question 7

(a) Most candidates multiplied their volume by 2: (12.5 x 4) x2 as the volume of each container. Some candidates would ignore the base area and tried to work out the radius of each cylinder first and hence a myriad of wrong answers would result.

(b) Candidates only calculated the volume of the cuboid instead of the water. Most candidates were calculating volume, L x B x H. Common answer was 10 x 4 x 6= 240.

(c) This question was not answered correctly by a majority of the candidates since most used 6-2 = 24 or 6-4 = 2 instead of $\frac{60}{40}$ = 1.5.

(d) Some candidates got this Question correctly but some only calculated 3 surfaces instead of 6. Some candidates used a height of the water, 4, to get an answer of 232 for the volume instead of using the cuboid of height 6.

Solutions

(a) 50

(b) 60

(c) 1.5

(d) 248

Question 8

(a) most candidates were saying *A-B* instead of *B-A* hence Candidates got $\binom{6}{4}$ instead of $\binom{-6}{-4}$.

(b) Most candidates got this question correctly where they simply halved part **(a)**.

(c) Most candidates got the gradient correctly but failed to calculate the y-intercept. Candidates could not calculate *c* using the fractional gradient. They substituted the gradient and gave equation as

$y = \frac{2}{3}x + c$ or $y = \frac{2}{3}x + 0$

(d) Most candidates failed to calculate the value of p. Candidates got 2 instead of $\frac{4}{3}$. Candidates could not substitute in the formula $y = mx+c$.

Solutions

(a) $\binom{-6}{-4}$

(b) $\binom{-3}{-2}$

(c) $3y = 2x + 2$

(d) $\frac{4}{3}$

Question 9

(a) Most candidates were able to draw the line y = 3 + x . A common wrong line drawn was for y = 3 – x.

(b) Most candidates did not use their drawn line to find the coordinates of x and y but used algebraic methods to find x and y.

(c) Most candidates got this question correct. Shading of region $y \leq 3x - 3$ was a problem for some candidates. Some wrong answers were due to failure to draw a correct line in (a) leading to a limited region.

A common wrong answer was shading above the given line. Candidates also drew a new line y =3 then shaded between it and y = 0.

Solutions

(a) line through (0, 3) and (-3, 0)

(b) x = 3, y = 6

(c) Shading below the line y = 3x – 3

Question 10

This was the most challenging question for the candidates.

(a) Candidates had a problem with writing an expression, Candidates wrote equations like x = 80km/hr

(b) (i) Some few candidates got this part correctly, otherwise most could not answer at all, they left blank spaces. There was no common wrong answer.

(ii) candidates wrote the formula for speed but had a problem with, substituting the values

(b) candidates could not form the required equation hence this question was the worst in terms of performance.

Solutions

(a) $\frac{x}{80}$

(b) (i) $x - 5$

(ii) $\frac{x-5}{120}$

(c) $x = 122$