Let the mind manage the body
Que l'esprit gère le corps

MAURITIUS EXAMINATIONS SYNDICATE

NCE 2021/2022

Mathematics

Subject code: N510

Examiners' Report

July 2023

Introduction

The National Certificate of Education (NCE) Assessment in Mathematics was first administered in April 2021. The assessment was de-loaded in that year considering the impact of the pandemic on students' learning. In 2022, the second edition of the NCE Mathematics assessment was administered in October of the same year on full syllabus. Students of Grade 9+ from the extended stream took part in the assessment for the first time.

The NCE Assessment assess mathematical skills acquired by candidates from Grade 7 to Grade 9. Candidates are assessed on the learning objectives spelt out in the Teaching and Learning Syllabus (TLS, MIE 2016).

Three Assessment Objectives, namely knowledge, application and reasoning underpin the design of this Mathematics paper.

AO1: Knowledge

Questions assessing *knowl*edge evaluate the recall and use of facts, concepts, rules and procedure which learners need to solve problems.

AO2: Application

Questions assessing *application* focus on learners' ability to apply their mathematical knowledge and skills to solve routine problems.

AO3: Reasoning

Questions assessing *reasoning* require candidates to deal with routine and non-routine problems which may be multi-step problems or may be set in complex contexts.

The NCE Mathematics Examiners' Report provides feedback on the performance of candidates and is meant to guide future candidates in the preparation of the assessment.

Key messages

To do well in this paper, candidates need to:

- demonstrate good understanding across the whole syllabus.
- be competent in basic numeracy skills (the four basic operations).

- be familiar with whole numbers, decimals and fractions and their conversion from one form to another.
- recall and apply necessary formulae.
- use acquired competencies to solve complex problems

General Comments

The difficulty level of the 2021/2022 Mathematics assessment paper was comparable to that the 2020/2021. The paper catered for candidates of all abilities.

It is noteworthy that the percentage of the number of students obtaining a grade 6 or better dropped to 69.4% in 2022 compared to 79.5% in 2020/2021. However, item analysis indicates that candidates tend to struggle with Mathematics. Many candidates did not develop the necessary mathematical skills to solve complex problems confidently.

The percentage pass for girls in this paper was 73.1, while the percentage pass for boys was 65.7. Girls' performance was thus better than the performance of boys in 2021/2022.

There were some well-presented scripts of a good standard. Candidates appeared to have had sufficient time to complete the paper. However, many scripts were found to be incomplete with answer spaces left blank mainly due to lack of knowledge of basic mathematical concepts, facts and rules. On the other hand, it was also common to note that some candidates had the necessary skills to devise proper strategies to solve problems, but could not reach the correct solution due to arithmetic errors while dealing with integers, fractions and decimals.

In many cases, candidates were not able to secure partial marks because of the omission of necessary workings. Many candidates failed to present their work in a clear and neat manner, resulting in loss of marks.

Analysis of candidates' scripts indicate the following:

- Many candidates have difficulties to carry out the four basic operations in Mathematics.
- Candidates tend to lose marks because of arithmetic mistakes which can be avoided if they are more careful.
- Many tend to omit intermediate steps and thus they cannot score partial marks.

- Sets, order of operations, algebra and solving inequalities tend to be problematic in general.
- Some candidates struggle with differentiating between L.C.M. and H.C.F.
- It was noted that candidates usually respond well to one-step or two-step problems. However, many candidates struggle to attempt long/structured questions which require higher order thinking skills and reasoning.
- In many cases, candidates could not make a logical link between the different parts of structured questions.
- It was common to find candidates fiddling with numbers to reach their answers.
- In general, candidates encounter challenges in recalling mathematical concepts learnt in lower grades. They performed less well in questions set on topics covered in G7 and G8. Lack of revision or insufficient preparation for examinations might also be a major cause.

Many candidates confidently and successfully attempted the very short answer/short answer questions and the MCQs.

Questions 11(h), 12(a),13,18, 20(b), 23, 24(b), 26, 27, 28(b), 30(b) and 31 proved to be challenging to many candidates.

Paper Overview

The paper comprised of 31 questions and the duration of the paper is 2 hours.

The table below shows the types of questions the paper consists of:

Question number	**Types pf questions**	**Marks**
1-10	Very short answer questions	1
11 (a-j)	Multiple choice questions	1
12 -22	Short answer questions	≥ 2
23 - 31	Long answer questions/structured questions	3 - 12

The different types of questions allowed candidates of all abilities to demonstrate their mathematical skills and competencies. The paper is graded starting from very simple questions at the beginning to more complex ones.

The use of calculators was not allowed for this paper.

Specific comments

The answer to each question is given in square brackets at the end of each specific comment. For question 11, answers are given in **Table 1**.
Questions 1 – 10 were straightforward and assessed mainly knowledge and understanding.

Question 1

1. Work out:

$$\begin{array}{r} 235 \\ +\ 451 \\ \hline \\ \hline \end{array}$$

The addition of the two 3-digit numbers was well-answered by almost all candidates. [Ans: 686]

Question 2

2. Evaluate:

$$\frac{6}{7} - \frac{2}{7}$$

Performance in this question involved simple subtraction of fractions with the same denominators was satisfactory. [Ans: $\frac{4}{7}$]

Question 3

3. Convert 3 km 250 m into metres.

This question was well attempted by many candidates.
However, wrong responses like 3000250 or 550 obtained from 300 + 250 were commonly seen. [Ans: 3250]

Question 4

4. Find $\sqrt{36}$.

A high proportion of candidates correctly answered this question with a few who gave 6×6 as their final answer which was incorrect.
[Ans: 6]

Question 5

Evaluate:

$-5-7$

Performance in this question was below average. The most popular wrong answers seen were -2 and 12. [Ans: -12]

Question 6

6. Express 0.25 as a percentage.

The majority of candidates knew that they had to multiply 0.25 by 100% and gave the correct answer.
Some candidates nevertheless converted 0.25 into a fraction and gave $\frac{25}{100}$ or $\frac{1}{4}$ as their final answers. [Ans: 25%]

Question 7

7. Simplify $x^6 \div x^4$.

This question was generally well-answered by most candidates. [Ans: x^2]

Question 8

8. Simplify $5ab - 4ab$.

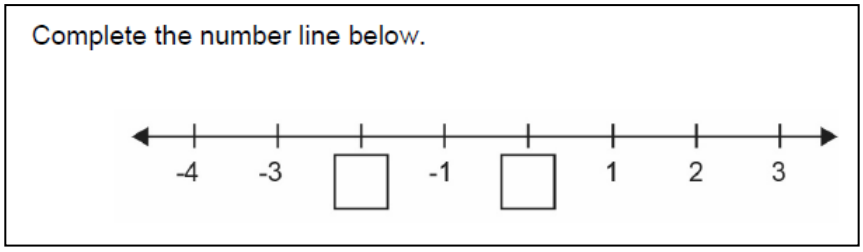
Many candidates attempted this question successfully. A few candidates gave their final answers as 1 or $(5-4)ab$ which were incorrect. [Ans: ab]

Question 9

Find the Highest Common Factor (H.C.F.) of $2y^2$ and y.

Many candidates showed confidence in finding the H.C.F. of algebraic terms. This question was well-answered by a large proportion of candidates. [Ans: y]

Question 10



Most candidates were able to complete the number line successfully.
[Ans: -2 and 0]

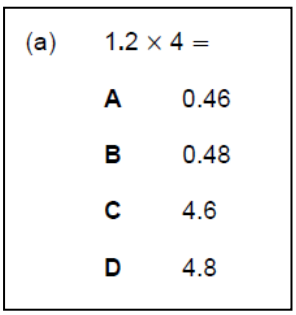
Question 11

Question 11 consisted of 10 multiple choice questions. They were mainly questions assessing knowledge and comprehension. Parts (e), (f) and (h) were particularly challenging for many candidates.

Part	Key	Most common distractor
(a)	D	-
(b)	A	B
(c)	D	A
(d)	B	A
(e)	B	A
(f)	C	A/B
(g)	A	C
(h)	D	A/C
(i)	B	D
(j)	C	B

Table 1

Comments on Specific Parts of Question 11



Part(a)

This item was well-answered by most of the candidates. They could successfully multiply a decimal number by a whole number.

Part(b)

How many sides does a **pentagon** have?

A 5

B 6

C 7

D 8

Performance in this question was good.
The most common distractor was option B (6) indicating that some candidates could not differentiate a pentagon from a hexagon.

Part(c)

Given that A = $\begin{pmatrix} 2 & 3 \\ 5 & -1 \\ 0 & 4 \end{pmatrix}$.

What is the order of matrix A?

A 2 × 3

B 3 × 3

C 2 × 2

D 3 × 2

This part was also satisfactorily answered by most candidates. Some candidates opted for distractor A. They found the order of the matrix by taking number of columns by number of rows instead of the number of rows by the number of columns.

Part(d)

What is the Lowest Common Multiple (L.C.M.) of 3 and 6?

A 3

B 6

C 9

D 18

About one third of the candidates could either not differentiate between L.C.M. and H.C.F (Distractor A) or multiplied the two given numbers to get 18 (Distractor D), which was a common multiple but not the **least** common multiple. Distractors A and D were quite popular.

Part(e)

(e) What is the value of 73.058 correct to 1 decimal place?

A 73.0

B 73.1

C 73.10

D 73.05

Slightly more than half of the candidates' population successfully approximated 73.058 to 1 decimal place.
Distractor A (73.0) was a strong distractor in this case.

Part(f)

(f) How is an angle between 90^o and 180^o called?

A An acute angle

B A right angle

C An obtuse angle

D A reflex angle

Although 'types of angles' is covered at both primary level and in Grade 7, many candidates could not recall that an angle found between 90^0 and 180^0 is an obtuse angle.
Many candidates chose options A or B.

Part(g)

(g) If $52 \times 148 = 7696$, then $51 \times 148 =$

A $7696 - 148$

B $7696 + 148$

C $7696 - 52$

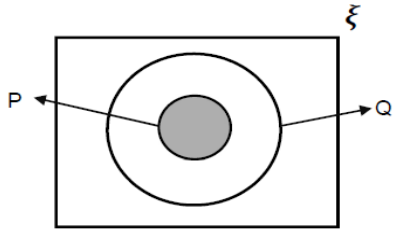
D $7696 + 52$

This part proved to be challenging for many candidates. Option C was a popular incorrect choice.

Part(h)

(h) Study the Venn diagram below.

Which one of the following statements is **true**?



A $P \in Q$

B $Q = P$

C $Q \subset P$

D $P \subset Q$

This was the least well-answered multiple-choice item. Even candidates scoring high marks did not find the correct answer. It appeared that set notation was not well grasped by the cohort.

Part(i)

(i) A rectangle has an area of 45 cm^2 and a width of 3 cm

What is its length?

A 14 cm

B 15 cm

C 105 cm

D 135 cm

Most candidates were successful in attempting this part.

Part(j)

(j) The cost of 6 pencils is Rs 90.

What is the cost of 3 pencils?

A 15

B 30

C 45

D 60

The majority of the candidates chose the correct option. This indicated firm understanding of the concept of proportion in general.

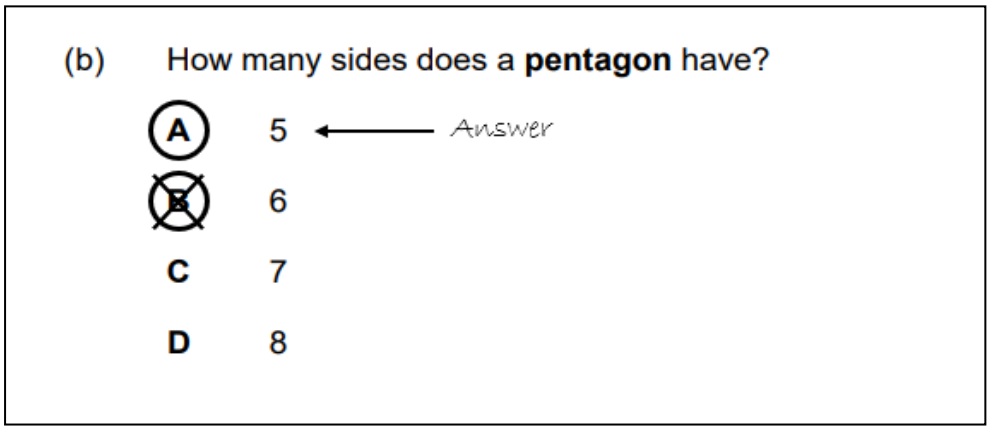
NOTE:

In case candidates have wrongly circled an option in the multiple-choice questions.

They are advised to:

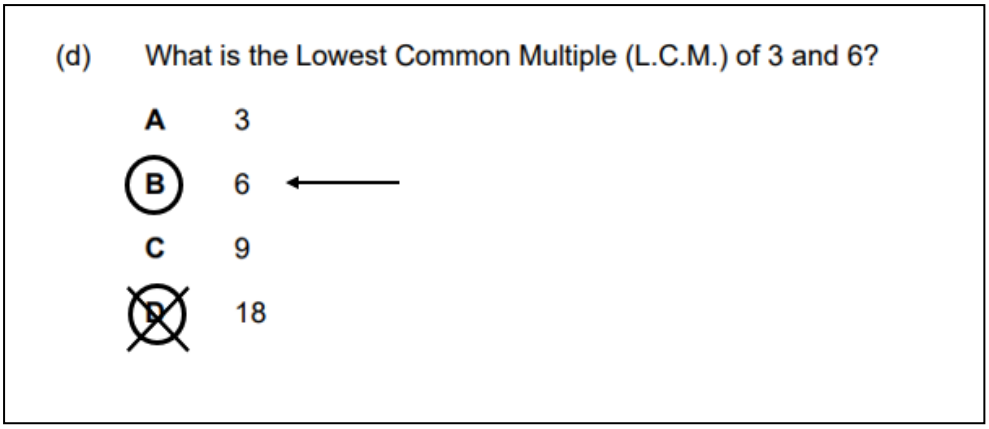
either

- Cross out the option which was wrongly selected and circled.
- Circle the letter corresponding to the option he/she now thinks is correct and indicate this clearly using an arrow and the word 'Answer', as illustrated below:



or

- Cross out the option which was wrongly selected and circled
- Circle the letter corresponding to the option he/she now thinks is correct and indicate this clearly using an arrow only as illustrated below:



Question 12(a)

What is the coefficient of x in the expression $8x^2 + 3x - 5$?

A significant number of candidates did not answer this question correctly. The term 'coefficient' did not seem familiar to them.

Some gave $3x$ as the answer while others equated the quadratic expression to zero and made unsuccessful attempts to solve the equation. [Ans: 3]

Question 12(b)

Factorise:

$$x^2 - 9$$

This part was well answered by many candidates. Candidates could recall and apply the 'difference of two squares' to expand the given expression. Incorrect expressions such as $(x + 9)(x - 9)$ and $(x - 3)^2$ were seen in some scripts. [Ans: $(x + 3)(x - 3)$]

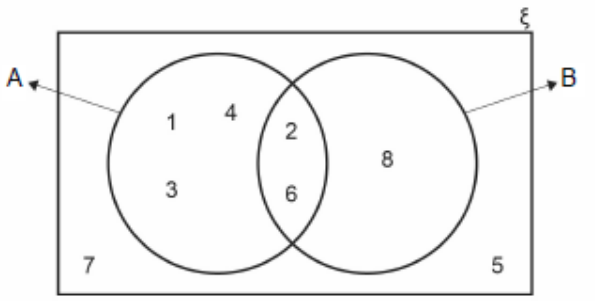
Question 12(c)

Find the value of $10 - 5 + \frac{3}{6}$. Give your answer as a **decimal**.

Only a few of the candidates were able to score full marks in this part. Some correctly subtracted 5 from 10 and went on to simplify $5\frac{3}{6}$ as $\frac{8}{6}$ or wrongly converted $5\frac{3}{6}$ to 5.3. One of the predominant wrong answer was 4.5, which resulted from the incorrect use of 'BODMAS'. Candidates added 5 to $\frac{3}{6}$ obtained $\frac{33}{6}$ which was they then subtracted from 10. [Ans: 5.5]

Question 13

Study the Venn diagram below carefully.



List the elements of set

(i) A,

(ii) A ∪ B.

(b) Write down $n(A' \cap B)$.

From the responses, it was clear that many candidates struggle while dealing with questions on the topic 'Sets'.

Question 13(a)(i)
It was very common to see only the elements 1, 3 and 4 being listed as element of set A. Candidates had the tendency to omit elements found in A ∩ B.
[Ans: {1, 2, 3, 4, 6}]

Question 13(a)(ii)
This part was well-answered by half of the candidates, even by those who did not score in part (a)(i).
[Ans: {1, 2, 3, 4, 6, 8}]

Question 13(b)
Very few candidates answered this part correctly. In many scripts, element 8 or elements 2 and 6 were listed as final answer. Candidates could not make sense of the meaning of the cardinal number of a set and they listed the element if A'∩ B or A ∩ B. Half of the candidates' population scoring grade 1 at NCE level was not successful in this part. [Ans: 1]

Question 14

Solve the inequality $2 - 5x < 12$.

One out of two candidates managed to score full marks.
Most of the candidates could recall the procedure of solving inequalities but could not get the correct final answer as a result of leaving arithmetic and algebraic mistakes.
The common wrong answers were:

- $x < -2$ resulting from **not** reversing the inequality sign when dividing by - 5.

- $x < 2$ resulting from writing $5x$ instead of $-5x$ when transferring the constant term '2' to the right-hand side.

- $x > 2$ resulting from correct transfer of the constant term '2' to the right-hand side, reversing the inequality sign but ignoring the negative sign when isolating x.
- A few candidates replaced '<' by '=' and solved equation $2 - 5x = 12$ instead of the inequality $2 - 5x < 12$.

It was also noticed that some candidates solved the inequality correctly in the working space but simply wrote – 2 in the answer space. [Ans: $x > -2$]

Question 15

> Mauritius is 4 hours ahead of GMT.
>
> Chicago is 6 hours behind GMT.
>
> When it is 03 30 in Chicago, what time is it in Mauritius?

Only around 40% of the candidates scored full marks.
It was common for candidates to use a 'colon' or a 'point' to separate the hour digits from the minute digits instead of inserting a space between them which was condoned.
Wrong answers that were mostly seen were:

- 01 30 [03 30 + 04 00(ahead) – 06 00 (behind)]
- 07 30 [03 30 + 04 00] considering only the fact that Mauritius is 4 hours ahead of GMT [Ans: 13 30 or 1.30 pm]

Question 16

> Solve $2^x = 16$.

This question on indices was accessible to many candidates who realised that they had to write 16 in the index form to base 2 and then equate the powers.
Around 30% of the candidates could not solve the equation.
A few candidates could not recognise 'x' as the index and solved the equation $2x = 16$ instead. [Ans: 4]

Question 17(a)

The two vectors $\begin{pmatrix} 5 \\ m+n \end{pmatrix}$ and $\begin{pmatrix} m \\ 6 \end{pmatrix}$ are equal.

(a) State the value of m.

The value of *m* was correctly stated by a vast majority of candidates. [Ans: 5]

Question 17(b)

(b) Find the value of n.

This part was also well answered by many candidates. Many candidates who did not score in part (a) earned credit in the second part. Some gave $n = 6 - m$ as their final answer which is an incomplete answer. Candidates should be able to read and understand simple instructions. In this case, they were supposed to, 'Find the **value** of n' . [Ans: 1]

Question 18

Figure 1 shows a square card with **area** 25 cm^2.

Figure 1

Six such cards are used to make the shape shown in Figure 2.

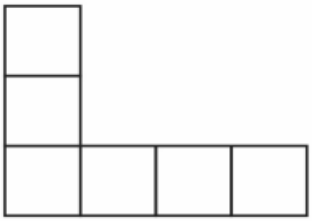


Figure 2

Find the **perimeter** of the shape shown in Figure 2.

Finding the perimeter of the shape proved to be challenging for many candidates.
One out of five candidates found the length of the square (5 cm) but did not proceed further.
Successful candidates adopted a systematic approach, going around the length of the shape and noting that the shape consisted of 14 external equal edges.

Sometimes, the correct length of one edge was found but then addition of the lengths was incorrect.
95 was a common wrong answer resulting from 19 × 5 (both the internal and external edges were considered).
In many scripts, the wrong answer 150 coming from 25 × 6 (area of the shape) was seen. [Ans: 70]

Question 19(a)

19. (a) A bag contains 6 black marbles and 4 white marbles.
A marble is chosen at random.

Find the probability that the marble is **not** white.

This part was well-answered by many candidates.

The most common incorrect answers were:

- $\frac{4}{10}$ which is the probability of obtaining a white marble instead of the probability of **not a** white marble.
- $\frac{2}{10}$ obtained from $\frac{6}{10} - \frac{4}{10}$. [Ans: $\frac{6}{10}$ **or** $\frac{3}{5}$ **or** 0.6 **or** 60%]

Question 19(b)(i)

(i) Complete the possibility diagram given below.

		Coin 2	
		Head (H)	**Tail (T)**
Coin 1	**Head (H)**		
	Tail (T)	(T, H)	

The possibility diagram was correctly filled by 60% of the candidates.
[Ans: (H , H) (H , T) (T , T)]

Question 19(b)(ii)

(ii) Find the probability that the coins show a head and a tail.
Give your answer in its **simplest form**.

Many candidates were able to earn full credit in this part. However, some candidates did not give their final answer in a simplified form.
The correct answer was also seen in scripts where the possibility diagram in part (i) was wrongly completed or not completed at all. [Ans: $\frac{1}{2}$ **or** 0.5 **or** 50%]

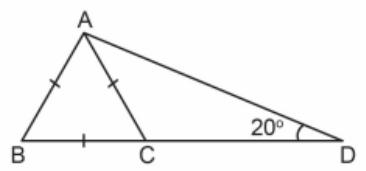
Question 20(a)

20. (a) Find the size of one angle in an **equilateral** triangle.

Many candidates recognised that the size of each interior angle of an equilateral triangle is 60^0. Wrong answers seen were 30^0 from $90^0 \div 3$ and 120^0 coming from $360^0 \div 3$. These showed that candidates knew they had to divide a sum of angles by 3. However, they did not recall that the sum of angles in a triangle is 180^0. [Ans:60^0]

Question 20(b)

C is a point on BD such that triangle ABC is equilateral and ∠ ADC = 20°.



Find ∠ CAD.

About a third of the candidates answered this question correctly.
The most common approach used by candidates was to:
(1) consider triangle ACD,
(2) find the angle ACD (120^0)
(3) find angle the CAD from $180^0 - 20^0 - \angle ACD$.
The second approach was to:
(1) consider triangle ABD
(2) find $\angle BAD$ (100^0)
(3) then find angle CAD from $100^0 - 60^0$.
Only a handful of candidates realised that the exterior angle ACB is the sum of the two interior angles, ∠ CAD and ∠CDA. [Ans: 40^0]

Question 21(a)

21. Given that:

$\mathbf{S} = \begin{pmatrix} 4 & -2 \\ 6 & 0 \end{pmatrix}$ $\mathbf{T} = \begin{pmatrix} -1 & 5 \\ 3 & 2 \end{pmatrix}$

Find

(a) $\frac{1}{2}\mathbf{S}$

(b) $\mathbf{ST}$

This question was successfully attempted by a large number of candidates. However, some of them could not earn full credit due to arithmetical errors.

Some of the common wrong answers were:

$\begin{pmatrix} 2 & -2 \\ 6 & 0 \end{pmatrix}$ resulting from multiplying only the first element by $\frac{1}{2}$.

$\begin{pmatrix} 2 & -1 \\ 3 & 2 \end{pmatrix}$ resulting from simplifying the last element $\frac{0}{2}$ as 2.

$\begin{pmatrix} 8 & -4 \\ 12 & 0 \end{pmatrix}$ resulting from multiplying all the elements by 2 instead of $\frac{1}{2}$.

[Ans: $\begin{pmatrix} 2 & -1 \\ 3 & 0 \end{pmatrix}$]

Question 21(b)

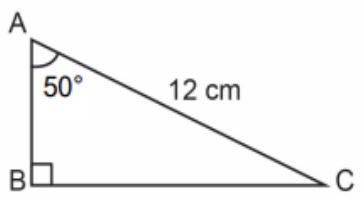
Less than 50% of the candidates could not find the product of two matrices. It was mainly due to arithmetic errors.

Another common wrong answer seen was $\begin{pmatrix} -4 & -10 \\ 18 & 0 \end{pmatrix}$ which resulted from the product of corresponding elements of matrices **S** and **T**.

[Ans: $\begin{pmatrix} -10 & 16 \\ -6 & 30 \end{pmatrix}$]

Question 22

22. In triangle ABC below, ∠ ABC = 90°, ∠ BAC = 50° and AC = 12 cm.



Using the information given below, as necessary, calculate the length of AB.
Give your answer to the **nearest whole number**.

[sin 50° = 0.77 cos 50° = 0.64 tan 50° = 1.19]

The first step towards solving this problem was to correctly identify the side AB as the adjacent and the side AC as the hypotenuse of triangle ABC.
Only around 35% of the candidates could identify the sides and could use the appropriate trigonometric ratio (the cosine ratio) to earn full marks. The more able candidates were able to calculate AB correctly showing all the necessary steps.
Around 20% of the candidates did not approximate their correct answer to the nearest whole number resulting in loss of marks.
The use of the sine ratio was also seen, which gave a length of 9.24 for AB.
[Ans: 8]

Question 23

23. The second and the third terms of a Fibonacci sequence are $2\frac{1}{3}$ and 3 respectively.

Find

(a) the first term of the sequence,

(b) the fourth term of the sequence.

Performance in this question was quite poor. Less than a third of the candidates' population made successful attempts. Many candidates did not seem to be familiar with the 'Fibonacci' sequence. They interpreted the sequence as a traditional one, with each

subsequent next term increasing by 2/3. Hence, the frequently seen wrong values were $1\frac{2}{3}$ for part (a) and $3\frac{2}{3}$ for part (b). [Ans: (a) $\frac{2}{3}$, (b) $5\frac{1}{3}$]

Question 24

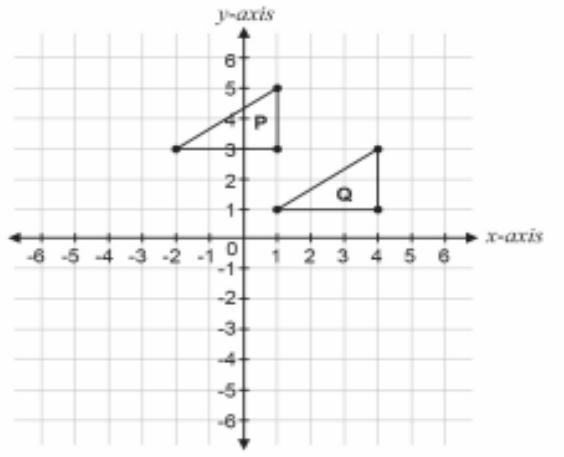
24. Triangle **P** and triangle **Q** are shown in the grid below.

On the same grid,

(a) draw the image of triangle **P** under a **reflection** in the x-axis and label it **R**. [2]

(b) write down the **translation vector** that maps triangle **P** onto triangle **Q**.

Answer: ..... [1]



Question 24(a)

A vast majority of the candidates was able to reflect triangle **P** in the x–axis, but did not label it as **R**. Some candidates wrongly reflected the vertex (-2, 3) and obtained its image as (-2, -5) instead of (-2, -3). [Ans: correct reflection in x-axis]

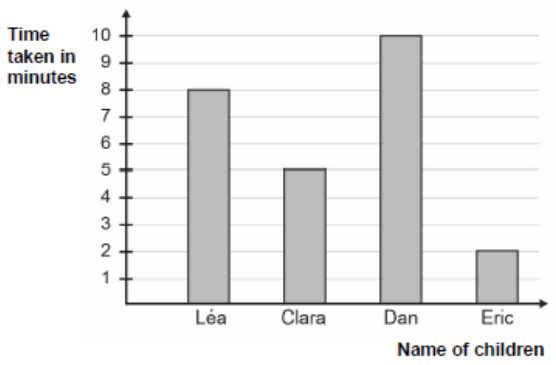
Question 24(b)

In general, candidates responded less well to the part(b) than part(a).

Some candidates correctly identified the translation vector to be a displacement of 3 units to the right and 2 units downwards, but wrote their answers in coordinates form rather than in vector form. [Ans: $\begin{pmatrix} 3 \\ -2 \end{pmatrix}$]

Question 25(a)

25. (a) The bar chart below shows the time taken by 4 children to complete a task.



Who completed the task **first**?

Most of the candidates obtained the correct answer. Among unsuccessful attempts, the most common wrong answer was 'Dan' (highest bar). This suggested that some candidates failed to realise that completing the task first meant taking the least amount of time.
[Ans: Eric]

Question 25(b)

(b) The numbers below are listed in ascending order.

10 11 11 12 13 14 15 17

Find the median.

The methodology of finding the median did not seem clear to many candidates.
It was noted that many identified 12 and 13 as the two middle terms and could not proceed to find the average of the 2 values. Instead, candidates gave 12 or 13 or both as their final answers.
It was also common to see 11 as the answer which was the mode of the distribution. This indicates a confusion between mode and median. [Ans: 12.5]

Question 25(c)

(c) 20 families were asked about the number of pets they have.
The information gathered is shown in the frequency table below.

Number of pets (x)	0	1	2	3	4	5
Number of families (f)	4	7	4	1	3	1

Find the mean number of pets that a family has.

Around one third of the candidate population answered part(a) correctly.
Finding the mean of ungrouped data in a table was somehow problematic and was clearly not understood by many candidates.
Common wrong answers were $\frac{35}{6}$ or $\frac{39}{6}$ or $\frac{15}{20}$ or $\frac{20}{6}$.
Some candidates who successfully obtained 1.75 in their workings, chose to round off their final answers to 1 or 2, assuming that the mean had to be a whole number as they were referring to number of pets. [Ans: 1.75 or equivalent]

Question 26

In a sale, the price of all items is reduced by 20%.
A refrigerator is sold at Rs 40 000 in the sale.

What was the original price of the refrigerator?

Despite being a common question set at PSAC and NCE level, it proved to be challenging to many candidates. Fewer than half of the candidates' population was able to solve the problem.
Only those who identified that Rs 40 000 represented 80% of the original price went on to earn full credit.
The most common incorrect method was (1) to calculate 20% of Rs 40 000 and then (2) to add it to Rs 40 000 which gave Rs 48 000 as answer. [Ans: 50 000]

Question 27(a)

27. (a) Complete the table of values for the line $y = 2x - 1$.

x	-2	0	2
y	-5	.....	3
(x, y)	(-2, -5)	(..... , ...)	(2, 3)

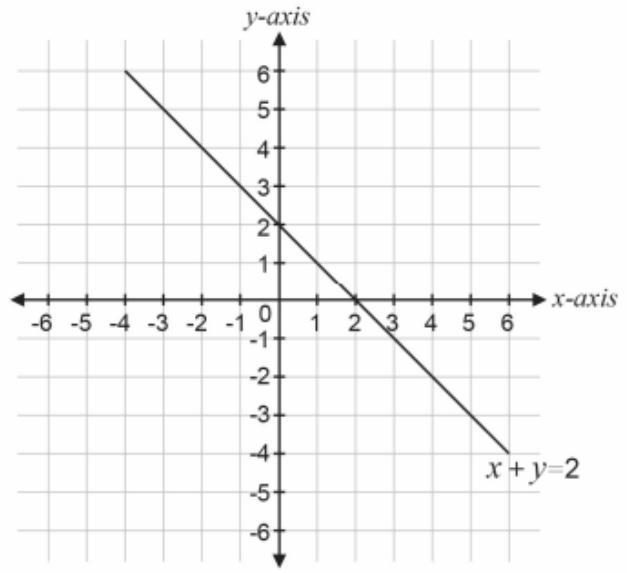
[2]

The value of 'y' was correctly found by only a few candidates.
Some managed to score a partial mark. [Ans: (0 , -1)]

Question 27(b)

(b) The line $x + y = 2$ is shown on the grid below.

Using part (a), draw the line $y = 2x - 1$ on the same grid.



Only a handful of the candidates were successful in drawing the straight line with equation $y = 2x - 1$. A large majority chose not to attempt this part.
Among the few who tried, a straight line passing through $(0\ ,\ -1)$ and $(2\ ,\ 0)$ was seen.
Many of those who could not complete the table in part (a) realised that they could still draw the line $y = 2x - 1$ using the 2 given points.
In general, candidates did not seem well prepared for this type of question.
[Ans: Ruled line $y = 2x$ -1 correctly drawn passing through (-2, -5) and (0, -1) **or** (0, -1) and (2, 3)]

Question 27(c)

(c) **Hence**, or **otherwise**, solve the simultaneous equations:

$$x + y = 2$$
$$y = 2x - 1$$

In this part, candidates were expected to read the coordinates of the point of intersection of the 2 lines in part (b) to obtain the solution to the simultaneous equations. They were unable to link the part(a) to part (b). This indicates a lack of conceptual understanding. Most candidates chose to solve the simultaneous equations by either elimination or substitution.

It was also observed that candidates who opted for the elimination method often reached $x = -3$ and $y = 5$ as they wrongly re-arranged the equation $y = 2x - 1$ as $2x + y = -1$. [Ans: 1,1]

Question 28(a)

28. Point A has coordinates (2, 3) and point B has coordinates (4, -1).

(a) Find the gradient of the line passing through A and B.

This part was generally well attempted by candidates. Most candidates were able to apply the gradient formula. Some careless arithmetic errors while dealing with integers, such as -1 - 3 giving -2 or 4 in the numerator was frequently seen. [Ans: -2]

Question 28(b)

(b) **Hence**, find the equation of the line passing through A and B.

A majority of the candidates knew what was expected from them. They correctly substituted their gradient obtained in part (a) and successfully obtained the value of the y-intercept (the value of 'c'). However, many candidates did not go further to write the equation of the line. Consequently, they could not earn full credit. It was important to write the equation of the line in the required form. Only candidates who gave their final answers as the equation
$y = -2x + 7$ or equivalent, were awarded full marks.
Statistics analyses suggests that candidates scoring more than 55 % in the assessment were more likely to find the equation of a straight line successfully.
[Ans: $y = -2x + 7$]

Question 29

29. A car travels a distance of 180 km from Town A to Town B at an average speed of 72 km/h.
Find the time taken by the car to travel from Town A to Town B.
Give your answer in hours and minutes.

Only around 40% of the candidates were able to score full marks. Many candidates seemed to have forgotten how to solve speed problems. This question proved to be particularly challenging for those scored less than 55 marks.

Candidates seem quite confident enough to use the formula 'Time taken $= \frac{\text{distance}}{\text{speed}}$.

Many candidates simplified their answer to obtain $\frac{5}{2}$ or 2.5.

It was noted that some candidates made unsuccessful attempts to express the final answer in hours and minutes.

It was also common to see 2 hours 36 minutes as the final answer which resulted from subtracting 72 km twice from 180 km and considering the remaining 36 km as 36 minutes. [Ans: 2 hours 30 minutes]

Question 30(a)

30. (a) Expand $x\,(x + 1)$.

This part was well answered by most candidates.

A few candidates encountered difficulties in applying the distributive law and $x^2 + 1$ was commonly seen. [Ans: $x^2 + x$]

Question 30(b)

(b) Use your answer to part (a) to solve

$x\,(x + 1) - 18 = 2$.

Many candidates unsuccessfully used their answer to part (a) to obtain a quadratic equation which was correctly solved.

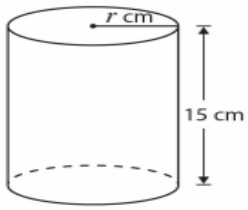
Only a small number of candidates earned partial marks.

It was noted that some candidates did not show all their workings. It is importan to encourage candidates to write all necessary workings to secure partial marks when their final answers are incorrect. [Ans: -5 , 4]

Question 31(a)

31. (a) A solid cylinder with height 15 cm and radius r cm has a volume of 735π cm^3.

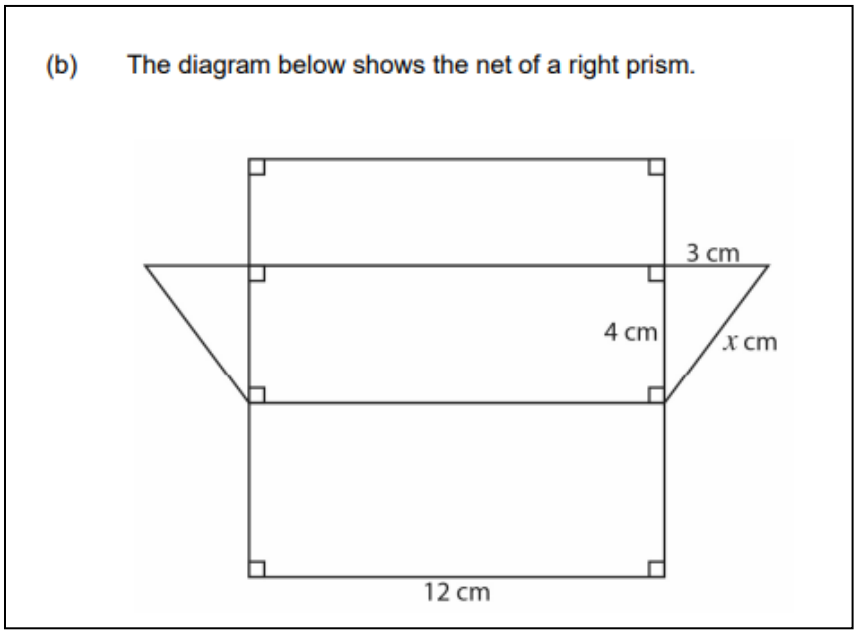
Find the value of r.



Only one out of four candidates could make sense of what was required in this question. Few understood that they had to equate the formula for volume of cylinder to 735π to get the correct answer.

The workings of most candidates here were often messy and difficult to follow. This possibly hindered candidates from thinking logically. Many cases of fiddling were noted. Some candidates started with $\frac{735\pi}{15}$ or $\frac{735}{15\pi}$ and fiddled to obtain 7 cm for the radius. [Ans: 7]

Question 31(b)(i)



A considerable number of candidates across all abilities were able to use the Pythagoras Theorem to reach the correct answer.

However, in some scripts, the value of x was given as 7 coming from 3 + 4 (the sum of the two shorter sides). [*Ans:* 5]

Question 31(b)(ii)

More than half of the candidates could not recognise the net of the prism. As a result they made unsuccessful attempts to find the total surface area.

It was clear from the workings that candidates mistook the prism for a cuboid. Partial marks were awarded for calculating either the area of one of the rectangles or the area of one triangle.

It was also common to see that candidates calculated the area of one rectangle as 48 obtained from 4×12 and multiplied it by 3, assuming that the three rectangles were identical.

The incorrect value 88 arising from $(12 \times 4 + 3 \times 2 + 4 \times 2 + 5 \times 2 + 5 \times 2 + 3 \times 2)$ which was the sum of all the edges of the prism was seen in quite a large number of scripts. [Ans: 156]

Question 31(b)(iii)
This part was generally well done by candidates who recognised the cross section of the prism and its depth.
It is worth noting that in many scripts, the answer space was left blank. Incomplete attempts were also seen. [Ans: 72]

Recommendations and conclusion

Candidates are advised to:

- read and interpret information/instructions and command words carefully.
- read questions till the end before attempting them to avoid missing out on any key information.
- show all necessary workings clearly in the appropriate space. Neat, clear and concise work presentation helps candidates to remain focused, ensures that the number of arithmetic mistakes is reduced and consequently increases candidates' chances to score marks. Also, evidence of working makes it possible for marks, where they are available, to be awarded for correct methods and intermediate results.
- attempt all questions even when some of them seem unfamiliar.
- to revise concepts learns at upper primary level, Grade 7 and Grade 8

Educators are advised to

- reinforce the learning of Mathematical fundamental concepts and operations on numbers including fractions and decimals through constant practice to build confidence.
- train students as that they develop problem-solving skills and have the ability to link different mathematical concepts learnt in Grade 7 to Grade 9.

Some candidates demonstrated good skills in carrying out mathematical procedures competently.

On the other hand, statistical analyses of the NCE results provides an indication that Mathematics is problematic for many candidates. It was apparent that many candidates lack confidence in solving problems, particularly when they were exposed to new contexts. Knowing the mathematical procedures but not gaining full score due to arithmetic errors, was common in scripts of candidates. Questions set topics taught in Grade 7 and Grade 8 were particularly challenging for candidates.