Results of Secondary 3 Mathematics in Territory-wide System Assessment 2026

The percentage of Secondary 3 students achieving Mathematics Basic Competency in 2026 is 78.3%.

Secondary 3 Assessment Design

- The design of assessment tasks for S.3 was based on the documents *Basic Competency Descriptors for Key Stage 3 Mathematics Curriculum* and *Mathematics Education Key Learning Area Curriculum Guide (Primary 1 – Secondary 6)* (2017). The tasks covered the three strands of the mathematics curriculum, namely **Number and Algebra**, **Measures, Shape and Space,** and **Data Handling**. They focused on the Foundation Part of the S.1 – 3 syllabuses in testing the relevant concepts, knowledge, skills and applications.

- The Assessment consisted of various item types including multiple-choice questions, fill in the blanks, answers-only questions and questions involving working steps. The item types varied according to the contexts of the questions. Some test items consisted of sub-items. Besides finding the correct answers, students were also tested on their ability to present solutions to problems. This included writing out the necessary statements, mathematical expressions and explanations.

- The Assessment consisted of 137 test items (190 score points), covering all of the 118 Basic Competency Descriptors. These items were organised into four sub-papers, each 65 minutes in duration and covering all three strands. Each student was required to attempt one sub-paper only. Some items appeared in more than one sub-paper to act as inter-paper links and to enable the equating of test scores. The number of items on the various sub-papers is summarised in Table 8.4. These numbers include several overlapping items.

Table 8.4 Number of Items and Score Points for S.3

Subject	No. of Items (Score Points)				
	Paper 1	**Paper 2**	**Paper 3**	**Paper 4**	**Total***
Mathematics					
Written Paper					
Number and Algebra	23 (30)	23 (30)	23 (29)	24 (28)	67 (89)
Measures, Shape and Space	17 (23)	18 (25)	17 (25)	17 (25)	53 (71)
Data Handling	7 (12)	6 (10)	7 (11)	6 (12)	17 (30)
Total	47 (65)	47 (65)	47 (65)	47 (65)	137 (190)

***** Items that appear in different sub-papers are counted once only.

The item types of the sub-papers were as follows:

Table 8.5 Item Types of the Sub-papers

Section	Percentage of Score Points	Item Types
A	~ 30%	• Multiple-choice questions
B	~ 30%	• Calculate numerical values • Give brief answers
C	~ 40%	• Solve application problems showing working steps • Draw diagrams or graphs • Open-ended questions requiring reasons or explanations

Performance of Secondary 3 Students Achieving Basic Competency in 2026

Secondary 3 Number and Algebra Strand

S.3 students performed fairly in this strand. In the learning units of this strand, many students had a good grasp of the basic concepts of directed numbers and rational and irrational numbers. Quite a number of students could solve problems related to basic computation, rates, ratios and proportions, algebraic expressions, linear equations in one unknown, linear equations in two unknowns, laws of integral indices, formulae and linear inequalities in one unknown. However, their performance in approximate values and numerical estimation, using percentages and polynomials was fair, while their performance in identities was quite weak. Comments on students' performance are provided with examples cited where appropriate (question number *x* / sub-paper *y* quoted as Q*x*/M*y*). More examples may also be found in the section ***General Comments***.

- Basic Computation: Students performed very well in using powers to express the repeated multiplication of a number and using repeated multiplication to express the power of a number. The majority of students could perform mixed arithmetic operations of positive integers involving two levels and at most three pairs of brackets. Nevertheless, their performance in finding the least common multiple of two numbers expressed as products of prime factors and performing prime factorisation of positive integers was not satisfactory.

Q21/M4
Exemplar Item (Perform prime factorisation of positive integers) Express 30 as a product of prime factors.
Example of Student Work (1) 3^3+5 (Not able to express as a product of prime factors) (2) $1\times3\times5\times2$ (Mistakenly regarded 1 as a prime factor)

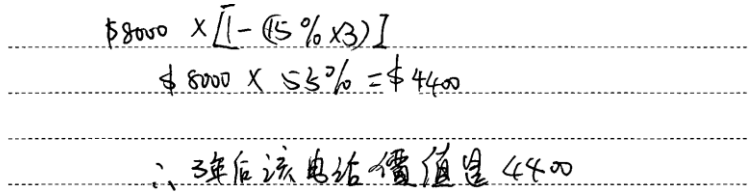
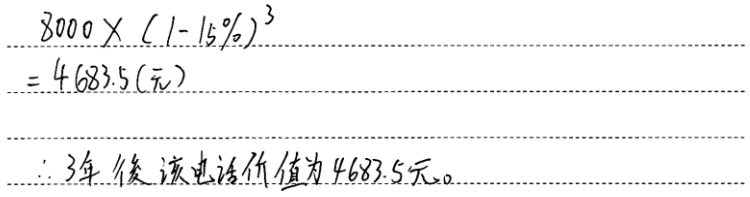
- Directed Numbers: Most students could demonstrate recognition of the ordering of integers on the number line. Their performance was satisfactory in using directed numbers to represent forward and backward jumps. Many students could perform mixed arithmetic operations of directed numbers.

- Approximate Values and Numerical Estimation: Many students could round off a number to 3 decimal places, and half of them could round off a number to 2 significant figures. However, their performance in using suitable estimation strategies to solve simple real-life problems was weak, with only a minority of students able to apply appropriate estimation strategies correctly.

Q40/M4
Exemplar Item (Use suitable estimation strategies to solve simple real-life problems) In a restaurant, customers can get a discount for any purchase of $888 or more. Lily's family ordered 3 dishes at the restaurant, priced at $308 , $461 and $212 respectively. Lily claims that they can get the discount. Based on the description above, use same estimation strategy (round up / round down) to give an appropriate approximation for each **UNDERLINED VALUE**. Hence, do you agree with Lily's claim ? Explain your answer.
Example of Student Work (Did not give an approximation for the price of each dish) the total price of 3 dishes = $(308+461+212) = $981 ∵ $981 > $888 ∴ I *agree / **disagree** with Lily's claim. (*Circle the correct answer)
Example of Student Work (Not able to use suitable estimation strategies) $308近似值≈$310　　小美的消费 = 310+460+210 $461近似值 ≈$460　　= 770+210 $212近似值 ≈$210　　= $980 $980 > $888 ∴我 * 同意 / **不同意** 小美的宣稱。 (*圈出正確答案)
Example of Student Work (Good performance) Total price of 3 dishes by rounding down each to tenth place = 308 + 461 + 212 ≈ 300 + 460 + 210 = $970 > $888 ∴ I *agree / **disagree** with Lily's claim. (*Circle the correct answer)

- Rational and Irrational Numbers: Many students could calculate the value of x in the expressions $\sqrt{x} = a$ and $\sqrt[3]{a} = x$. Their performance in representing rational numbers on the number line was satisfactory, while quite a number of students could demonstrate recognition of the concepts of rational and irrational numbers.

- Using Percentages: Many students could solve simple problems involving profit or loss. Their performance in solving problems on percentage increase and percentage change in mathematical context and solving problems on simple interest was fair. As for solving simple problems on annual compound interest and depreciation, there was room for improvement.

Q40/M2
Exemplar Item (Solve simple problems on depreciations) The value of a smart phone is $\$8\,000$. The rate of depreciation is 15% per year. Find the value of the smart phone after 3 years.
Example of Student Work (Not able to use the appropriate formula) 
Example of Student Work (Wrong computation) 

- Rates, Ratios and Proportions: Students performed satisfactorily in using rates and ratios to solve simple real-life problems. Quite a number of students could distinguish direct and inverse proportions and use direct and inverse proportions to solve simple real-life problems. Their performance in representing a ratio in the form $a : b$ was acceptable.

- Algebraic Expressions: The majority of students could write down the next term of a sequence of triangular numbers with several consecutive terms given and formulate algebraic expressions from word phrases. However, their performance in demonstrating recognition of notations of algebraic expressions was quite weak (Please refer to the General Comments). Their performance in finding a particular term from the general term of a sequence was acceptable, although some students did not complete the calculation of the value of the required term.

Q26/M4
Exemplar Item (Find a particular term from the general term of a sequence) The nth term of a sequence is $3n+2$. Find the value of the 4th term of the sequence.
Example of Student Work (Did not complete the calculation of the term's value) (1) 該數列第 4 項的值是 $3(4)+2$ 。 (2) The value of the 4th term of the sequence is $12+2$.

- Linear Equations in One Unknown: Students showed good performance in solving simple linear equations in one unknown, and many of them demonstrated an understanding of the meaning of solutions of equations. Half of the students could formulate a linear equation in one unknown from a simple problem.

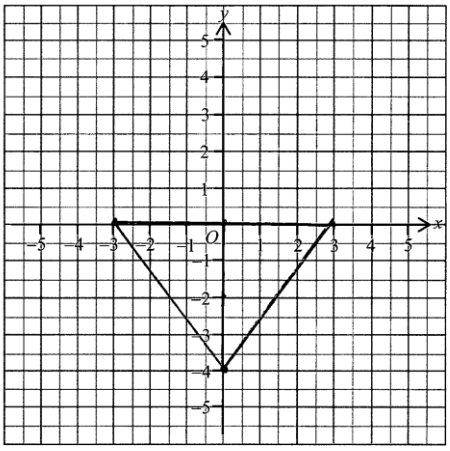
- Linear Equations in Two Unknowns: Students performed satisfactorily in solving simple simultaneous linear equations in two unknowns by the graphical method and formulating simultaneous linear equations in two unknowns from simple problem situations. Quite a number of students could demonstrate recognition that graphs of equations of the form $ax + by + c = 0$ are straight lines. Their performance in determining whether a point lies on a straight line given its linear equation and solving simple simultaneous linear equations in two unknowns by algebraic methods was acceptable. However, there was room for improvement in plotting graphs of linear equations in two unknowns.

Q41/M1

Example of Student Work (Calculated the corresponding values of y correctly, but failed to plot the corresponding graph.)

$2x-3y-6=0$

x	-3	0	3
y	-4	-2	0

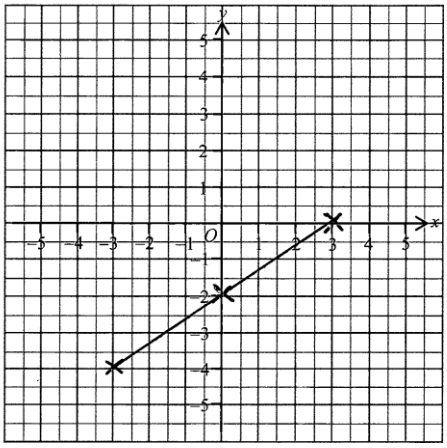


Q41/M3

Example of Student Work (Did not extend two ends of the line)

$y=\frac{2}{3}x-2$

x	-3	0	3
y	-4	-2	0



- Laws of Integral Indices: Many students could simplify simple algebraic expressions using the laws of integral indices and convert a positive number expressed in scientific notation to an integer. Their performance in finding the value of a^n (where a is a non-zero integer and n is a negative integer) and representing a positive number in scientific notation was acceptable.

- Polynomials: Many students could perform multiplication of a monomial by a trinomial and distinguish factorisation and expansion of polynomials. Their performance in distinguishing polynomials from algebraic expressions and arranging the terms of a polynomial in descending order was fair. Half of the students could perform addition or subtraction of two polynomials, multiplication of two binomials and factorisation of expressions of the form $ax^2 + bx + c$. On the other hand, there was still room for improvement in demonstrating recognition of constant terms and factorising simple polynomials by taking out common factors.

Q27/M4
Exemplar Item (Demonstrate recognition of constant terms) Write down the constant term of the polynomial $6x^4 + 7x + 2$.
Example of Student Work (1) 6 (Confused the constant term with the coefficient of x^4) (2) 6 , 7 , 2 (Wrong computation)
Q28/M2
Exemplar Item (Factorise simple polynomials by taking out common factors) Factorise $3a^2 + 6ab - 12ac$.
Example of Student Work (1) $3a(a+2b+4c)$ (Not able to handle the negative sign correctly when taking out common factors) (2) $3(a^2+2ab-4ac)$ (Not able to take out all common factors completely)

- Identities: Students performed acceptably in factorising simple polynomials using the identity of the difference of two squares. However, their performance in indicating whether an equation was an identity and using the identity of the perfect square to expand simple algebraic expressions was quite weak.

Q29/M2
Exemplar Item (Use the identities of perfect square to expand simple algebraic expressions) Expand $(3x-5)^2$.
Example of Student Work (1) $9x^2-25$ (Mistakenly thought that $(a-b)^2=a^2-b^2$) (2) $(3x-5)(3x-5)$ (Did not fully expand the algebraic expression)

- Formulae: Quite a number of students could perform operations on two algebraic fractions and substitute values into formulae in which all exponents are positive integers to find the value of a specified variable. As for performing changes of subject in simple formulae not involving radical signs, there was room for improvement.

Q29/M3
Exemplar Item (Perform change of subject in simple formulae not involving radical sign) Make m the subject of the formula $h=-3m+10$.
Example of Student Work (1) $\frac{10-h}{3}$ (Failed to give the complete answer) (2) $m=\frac{h+10}{+3}$ (Wrong computation)

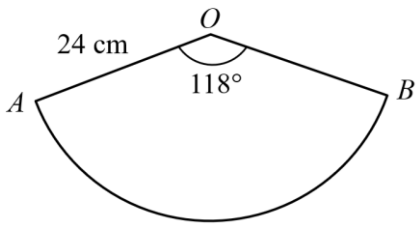
- Linear Inequalities in One Unknown: Students performed well in determining whether a number satisfied a given inequality. Quite a number of students could represent inequalities on the number line and formulate a linear inequality in one unknown from a simple problem situation. Their performance in demonstrating recognition of the properties of inequalities and solving simple linear inequalities in one unknown with integral coefficients and constants was acceptable.

Secondary 3 Measures, Shape and Space Strand

S.3 students performed acceptably in this strand. In the learning units of this strand, the majority of students could solve problems related to quadrilaterals. Many students had a good grasp of the basic concepts of 3-D figures and Pythagoras' Theorem. Quite a number of students could solve problems involving angles and parallel lines, the rectangular coordinate system and trigonometry, while their performance in arc lengths and areas of sectors, congruent triangles, similar triangles and centres of triangles was acceptable. Their performance in mensuration and polygons was quite weak, whereas their performance in errors in measurement was not satisfactory. Comments on students' performance are provided with examples cited where appropriate (question number *x* / sub-paper *y* quoted as Q*x*/M*y*). More examples may also be found in the section ***General Comments***.

- Errors in Measurement: Half of the students could find the range of measures in measurements of given degrees of accuracy. However, their performance in finding maximum absolute errors when using given measuring tools and calculating relative errors from given measurements was weak. (Please refer to the General Comments)

- Arc Lengths and Areas of Sectors: More than half of the students could calculate arc lengths. However, there was room for improvement in calculating areas of sectors.

Q42/M1
Exemplar Item (Calculate areas of sectors) In the figure, the radius of sector OAB is 24 cm and $\angle AOB = 118°$. Find the area of the sector correct to 3 significant figures. 
Example of Student Work (Not able to use the correct formula for calculating the area of the sector) ∴ Area of sector $\pi(24)^2 + \frac{118°}{360°}$ $= 1810$ cm

Example of Student Work (Confused areas of sectors with arc lengths)

Area of sector

$2\pi(24) \times \frac{118^\circ}{360^\circ}$

$= 49.4\ cm^2$

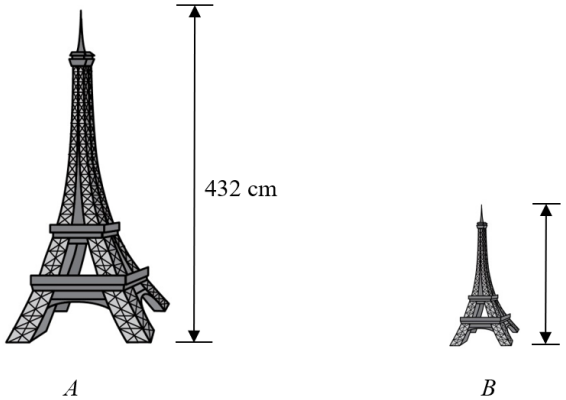
- 3-D Figures: Most students could demonstrate recognition of the concepts of right circular cones. The majority of students could demonstrate recognition of sections of pyramids. Meanwhile, their performance in sketching the 2-D representations of right pyramids was quite weak.

- Mensuration: The majority of students could calculate the volume of pyramids. Their performance in using the formulae for the volumes of prisms to find unknowns and calculating the surface areas of right prisms was acceptable. Almost half of the students could calculate the volume of spheres. However, only some students could use the formulae for the surface areas of right circular cylinders to find unknowns. Their performance in solving problems involving the relationship between sides and volumes of similar 3-D figures was weak.

Q44/M1

Exemplar Item (Use the relationships between sides and volumes of similar 3-D figures to solve problems)

In the figure, A and B are similar 3-D models. The volume of A is 27 times that of B. If the height of A is 432 cm, find the height of B.



Example of Student Work (Mistakenly thought that the ratio of the volumes of two similar models was the same as the ratio of their corresponding sides)

ratio of A to B = 27 : 1

$\frac{27}{1} = \frac{432}{B}$

$B = 16$

∴ the height of B is 16cm

Example of Student Work (Confused the relationship between the ratio of corresponding sides and the ratio of volumes of two similar models)

$\frac{B}{432} = (\frac{1}{27})^3$

$B \approx 0.02$ cm

∴ Required height $\approx$ 0.02 cm

- Angles and Parallel Lines: Students were good at using angle properties associated with parallel lines and the properties of adjacent angles on a straight line and vertically opposite angles to find unknowns. Many students could identify corresponding angles, alternate interior angles and interior angles. Quite a number of students could use the properties of angles of triangles to find unknowns. Their performance in using the conditions of alternate interior angles are equal to perform simple proofs of two straight lines being parallel was acceptable.

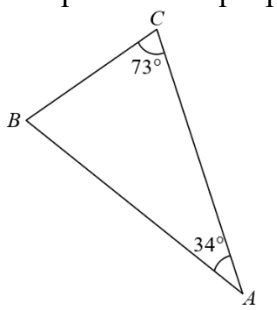
- Polygons: Quite a number of students could use common notations to represent polygons. Their performance in using the formulae for the sums of interior angles and exterior angles of convex polygons to find unknowns was fair. However, their performance in demonstrating recognition of the concepts of polygons and regular polygons was weak. (Please refer to the General Comments)

- Congruent Triangles: The majority of students could demonstrate recognition of the properties of congruent triangles and use the relations between sides and angles associated with isosceles triangles to find unknowns. Quite a number of students could demonstrate recognition of the conditions for congruent triangles. However, their performance in using the conditions for congruent triangles to perform simple proofs was quite weak, while their performance in using the condition for isosceles triangles to perform simple proofs was not satisfactory.

Q45/M2

Exemplar Item (Use the condition for isosceles triangles to perform simple proofs)

In the figure, $\angle BAC = 34°$ and $\angle ACB = 73°$.
Prove that $\triangle ABC$ is an isosceles triangle.



Example of Student Work (Not able to provide complete proof and reasons)

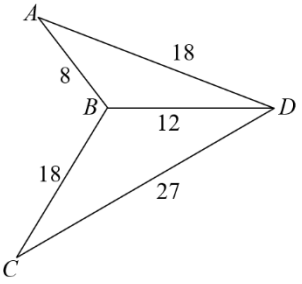
角和: ∵ △內角總和為 180°
∴ ∠CBA 為 180° − 73° − 34°
= 73°
∴ ∠BCA = ∠CBA = 73°
∴ △ABC 有兩個等角形。

∠CBA = 180° − 73° − 34° (∠ sum of △)
= 73°
∠CBA = ∠BCA (isos. △)
∴ △ABC is an isos. triangle

Example of Student Work (Good performance)

∠ABC = 180° − 73° − 34° (∠ sum of △)
= 73°
∵ ∠ABC = ∠ACB = 73°
∴ AB = AC (sides opp. equal ∠s)
∴ △ABC is an isos. △

- Similar Triangles: Many students could demonstrate recognition of the properties of similar triangles, and quite a number of them could demonstrate recognition of the conditions for similar triangles. However, their performance in using the conditions for similar triangles to perform simple proofs was not satisfactory.

Q44/M4
Exemplar Item (Use the conditions for similar triangles to perform simple proofs) In the figure, $AB = 8$, $AD = BC = 18$, $BD = 12$ and $CD = 27$. Prove that $\triangle ABD \sim \triangle DBC$. 
Example of Student Work (Not able to provide correct reasons) In $\triangle ABD$ & $\triangle DBC$ $\frac{AD}{DC} = \frac{18}{27} = \frac{2}{3}$ $\frac{AB}{DB} = \frac{8}{12} = \frac{2}{3}$ $\frac{BD}{BC} = \frac{12}{18} = \frac{2}{3}$ $\therefore \frac{AD}{DC} = \frac{AB}{DB} = \frac{BD}{BC} = \frac{2}{3}$ $\therefore \triangle ABD \sim \triangle ABD$ (corr. sides)
Example of Student Work (Not able to use the conditions for similar triangles to perform simple proof) In $\triangle ABD$, $\triangle DBC$, $BD = DB$ (common sides) $\frac{AD}{DC} = \frac{18}{27}$ $= \frac{2}{3}$ $\frac{BD}{BC} = \frac{12}{18}$ $= \frac{2}{3}$ $\therefore \triangle ABD \sim \triangle DBC$ (SSS)

- Quadrilaterals: The majority of students could use the properties of rectangles to find unknowns. Their performance in using the properties of parallelograms to find unknowns was satisfactory.

- Centres of Triangles: Students performed acceptably in identifying medians, perpendicular bisectors, altitudes and angle bisectors of a triangle.

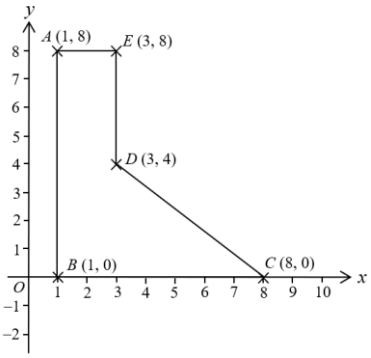
- Pythagoras' Theorem: Many students could use Pythagoras' Theorem to find unknowns. Their performance in using the converse of Pythagoras' Theorem to identify right-angled triangles was satisfactory.

- Rectangular Coordinate System: Most students could use coordinates to represent the position of a point. Quite a number of students could use the slope formula to find the slope of a straight line passing through two given points, demonstrate recognition of the relationships between the slopes of parallel and perpendicular lines, use the mid-point formula to find the mid-point between two points, and use the distance formula to find the distance between two points. Their performance in finding the image of a given point reflected in the *y*-axis was acceptable. However, their performance in calculating the area of polygons in the rectangular coordinate plane was quite weak.

Q44/M2

Exemplar Item (Calculate area of polygons in the rectangular coordinate plane)

Find the area of polygon $ABCDE$ in the figure.



Example of Student Work (Wrong computation and incorrect unit)

∴ Area of polygon ABCDE

$= (2 \times 2) + \frac{(2+7) \times 4}{2}$

$= 4 + 18$

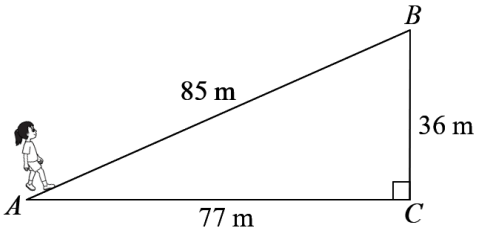
$= 22\ cm^2$

Example of Student Work (Unclear expression and missing unit)

AE = 3 - 1 = 2
ED = 8 - 4 = 4
BC = 8 - 1 = 7
設 F 為 (1, 4)
BF = 4

2 × 4 + (2 + 7) × 4 ÷ 2
= 26

- Trigonometry: Many students could find the tangent of an angle and find an angle from a given cosine. Quite a number of students could solve right-angled triangles involving sine and tangent, and solve simple problems involving one right-angled triangle. However, there was room for improvement in demonstrating recognition of the concept of gradient.

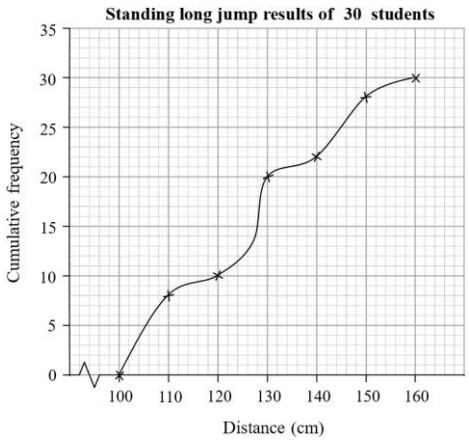
Q36/M4
Exemplar Item (Demonstrate recognition of the concept of gradient) In the figure, Kate walks upwards along path AB of length 85 m, the vertical distance BC is 36 m and the horizontal distance AC is 77 m. Find the gradient of the path AB. 
Example of Student Work (1) 小徑 AB 的斜率是 2.14 。 (Incorrectly calculated the gradient by dividing 77 by 36) (2) 小徑 AB 的斜率是 25° 。 (Confused the gradient with the angle of inclination)

Secondary 3 Data Handling Strand

S.3 students performed fairly in this strand. They performed relatively better in measures of central tendency, and more than half of them could handle problems related to the organisation of data, presentation of data and probability. Comments on students' performance are provided below with examples cited where appropriate (question number *x* / sub-paper *y* quoted as Q*x*/M*y*). More examples may also be found in the section ***General Comments***.

- Organisation of Data: Students performed acceptably in organising the same set of data by different grouping methods.

- Presentation of Data: Students performed satisfactorily in interpreting histograms and constructing cumulative frequency polygons. Quite a number of students could read off data from statistical charts representing two different sets of data. Half of the students could construct stem-and-leaf diagrams and identify abuses from examples of abuses of statistical charts. However, their performance in choosing appropriate statistical charts to present data and interpreting cumulative frequency curves was quite weak.

Q38/M1
Exemplar Item (Interpret cumulative frequency curves) The cumulative frequency curve below shows the distribution of the standing long jump results of 30 students.  According to the above diagram, answer the following questions. (a) Find the median of the standing long jump results of 30 students. (b) A student with a result of less than 120 cm needs to attend the Fitness Enhancement Class. How many students in that group needed to attend the Fitness Enhancement Class?

Example of Student Work

(1) (a) 該 30 名學生立定跳遠成績的中位數是 130 cm 。

(Mistakenly thought that the median was represented by the midpoint on the *x*-axis)

(2) (b) 該批學生當中共有 8 人需要參加「體適能強化班」。

(Mistakenly thought that students whose results did not reach 120 cm referred to those with results of less than or equal to 110 cm)

- Measures of Central Tendency: The majority of students could find mean and modal class from a set of ungrouped data. Quite a number of students could find mean and modal class from a set of grouped data and calculate the weighted mean of a set of data. However, their performance in indicating the abuses from examples of abuses of the mean was not satisfactory.

Q47/M1

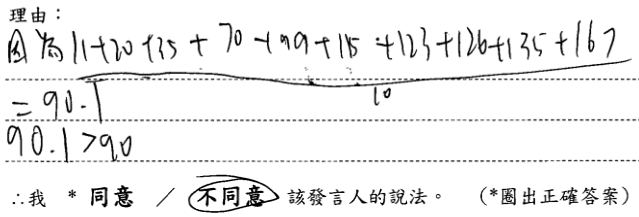
Exemplar Item (Indicate the abuses from examples of abuses of mean)

Due to adverse weather conditions, an airline had a total of 10 departing flights delayed yesterday. The following are the departure delay times (minutes) for the flights.

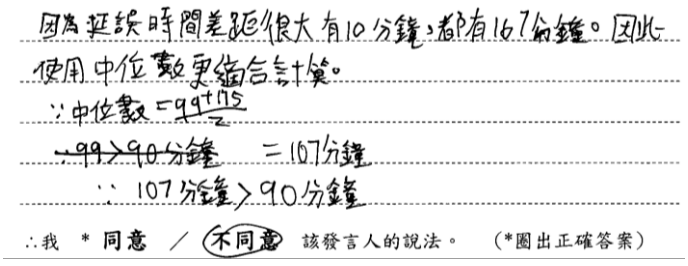
10 20 35 70 99 115 123 126 135 167

It is given that the mean of the departure delay times for the flights is 90 minutes. Hence, the spokesperson for the airline claimed, " Over half of the flights had departure delay times of less than 90 minutes. "
Do you agree with the spokesperson's claim? Explain your answer.

Example of Student Work (Incorrectly calculated the mean ,wrong computation and did not understand the reasons for the misleading information)



Example of Student Work (Not able to indicate the abuses)



- Probability: Students performed well in calculating probability by listing. However, there was room for improvement in calculating relative frequency.

General Comments on Secondary 3 Student Performances

The overall performance of S.3 students was steady and broadly comparable to that of last year. Their performance in the Number and Algebra and Data Handling strands was fair, while their performance in the Measures, Shape and Space strand was acceptable.

The areas in which students demonstrated adequate skills are listed below:

Basic Computation

- Use powers to express the repeated multiplication of a number and use repeated multiplication to express the power of a number (e.g. Q1/M1)
- Perform mixed arithmetic operations of positive integers involving two levels and at most three pairs of brackets (e.g. Q21/M1)

Directed Numbers

- Demonstrate recognition of the ordering of integers on the number line (e.g. Q22/M1)

Algebraic Expressions

- Write down the next term of a sequence of odd numbers, even numbers, square numbers and triangular numbers with several consecutive terms given (e.g. Q25/M3)

Linear Inequalities in One Unknown

- Determine whether a number satisfies a given inequality of $x > a$, $x \geq a$, $x < a$ and $x \leq a$ (e.g. Q10/M3)

3-D figures

- Demonstrate recognition of the concepts of right prisms, right circular cylinders, right pyramids and right circular cones (e.g. Q32/M1)
- Demonstrate recognition of the sections of prisms, circular cylinders, pyramids and circular cones (e.g. Q12/M3)

Rectangular Coordinate System

- Use coordinates to represent the position of a point and mark the point with given coordinates (e.g. Q17/M3)

Apart from the areas in which students performed well, the assessment data also provide useful insights into areas that could be strengthened in learning and teaching. The most noteworthy observations are detailed below:

Basic Computation

- Find the least common multiple of two numbers which are expressed as products of prime factors (e.g. Q1/M3): About 30% of the students chose the correct answer "B". However, more than 30% of the students selected option "D", indicating that they confused the concepts of the least common multiple and the greatest common divisor.

Q1/M3
Find the least common multiple (L.C.M.) of $3^2 \times 7$ and $2^2 \times 3 \times 7$. A. $2^2 \times 3^3 \times 7^2$ B. $2^2 \times 3^2 \times 7$ C. $2 \times 3 \times 7$ D. 3×7

Algebraic Expressions

- Demonstrate recognition of notations of algebraic expressions such as $2x$, $2 + x$, x^2 , $(-2)^n$ and -2^n , etc. (e.g. Q4/M3): Half of the students chose the correct answer "C". However, more than 30% of the students selected option "A", showing that they mistakenly thought that $(-m)^2 = -m^2$. About 10% of the students selected option "B", indicating that they mistakenly thought that $m^2 + (-m)^2 = m^{2+2}$.

Q4/M3
$m^2 + (-m)^2 =$ A. 0 . B. m^4 . C. $2m^2$. D. $2m^4$.

Linear equations in one unknown

- Formulate a linear equation in one unknown from a simple problem situation (e.g. Q5/M3): Half of the students chose the correct answer "D". About 20% of the students selected option "B", indicating that they were unable to formulate a linear equation according to the given context.

Q5/M3
Eric is y years old now. His father is 36 years older than him. After two years, his father's age will be 3 times Eric's age. Which of the following equations can be used to find the value of y ? A. $3y+2=y+36$ B. $3(y+2)=y+36$ C. $y+2=3(y+36+2)$ D. $3(y+2)=(y+36)+2$

Identities

- Indicate whether an equation is an identity (e.g. Q9/M2): Almost half of the students chose the correct answer "D". More than 30% of the students selected option "C", indicating that they mistakenly thought that $(a+b)^2=a^2+b^2$. About 10% of the students selected option "B", showing that they failed to recognise that $2(x+3)=2x+3$ is not an identity.

Q9/M2
Which of the following is an identity ? A. $x=3$ B. $2(x+3)=2x+3$ C. $(x+3)^2=x^2+9$ D. $x+3=3+x$

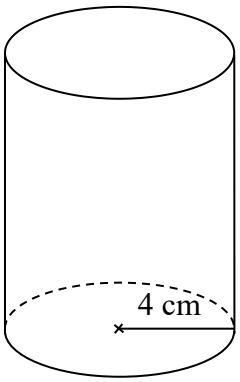
Errors in Measurement

- Calculate relative errors from given measurements (e.g. Q10/M1): Only about 10% of the students chose the correct answer "D". More than 20% of the students selected each of options "A", "B" and "C", indicating that they were unable to calculate the relative error correctly. A small proportion of students confused relative error with maximum absolute error, while others incorrectly assumed that the maximum absolute error was 0.1 cm.

Q10/M1
The length of an object is measured as 4.0 cm (correct to 2 significant figures). Find the relative error of the measured value. A. $\frac{1}{4}$ B. $\frac{1}{20}$ C. $\frac{1}{40}$ D. $\frac{1}{80}$

Mensuration

- Use the formulae for the surface areas of right circular cylinders to find unknowns (e.g. Q12/M1): About 30% of the students chose the correct answer "B". However, nearly 30% selected option "A", suggesting that they confused the concepts of surface area and volume of a right circular cylinder.

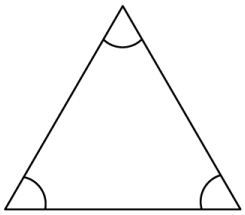
Q12/M1
The figure shows a solid right circular cylinder. Its base radius is 4 cm and its total surface area is $112\pi\ \text{cm}^2$. Find the height of the circular cylinder. A. 7 cm B. 10 cm C. 12 cm D. 14 cm 

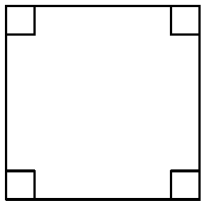
Polygons

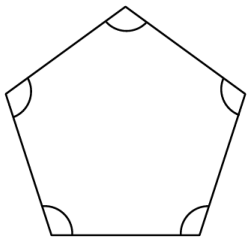
- Demonstrate recognition of the concepts of polygons and regular polygons (e.g. Q14/M1): Only about 10% of the students chose the correct answer "A". Half of the students selected option "B", indicating that they mistakenly thought that an equiangular polygon was a regular polygon.

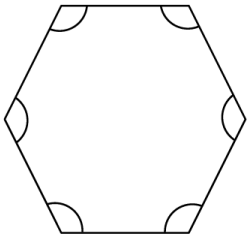
Q14/M1

Which of the following figures **MUST** be a regular polygon?

A. 

B. 

C. 

D. 

Presentation of Data

- Choose appropriate statistical charts to present data (e.g. Q19/M1): Almost half of the students chose the correct answer "A". Nevertheless, more than 20% selected option "B", indicating that they mistakenly thought that a histogram was the most appropriate statistical chart for presenting the given data.

Q19/M1

The table below shows the numbers of participants from S1 to S6 in a joint school music competition.

Class level	S1	S2	S3	S4	S5	S6
Number of participants	19	25	27	23	22	4

Miss Wong analyses the proportion of participants at each level relative to the total number of participants. Which of the following is the most suitable statistical chart for presenting the data above?

A. Pie chart

B. Histogram

C. Broken line graph

D. Cumulative frequency curve

Good Performance of Secondary 3 Students in 2026

- Students with good performance demonstrated mastery of the mathematical concepts and problem-solving skills assessed by the sub-papers. They performed well in computation and problem-solving, and were able to apply flexibly the concepts of directed numbers, rational and irrational numbers, percentages, rates, ratios and proportions to solve problems. These students had a good understanding of algebra. They could demonstrate an understanding of equations and inequalities, and perform operations with polynomials, as well as factorise and expand polynomials. They could also apply the laws of integral indices and formulae to solve problems, and use appropriate methods to solve linear equations in one unknown, simultaneous linear equations in two unknowns and linear inequalities in one unknown.

- Students with good performance demonstrated mastery of the important concepts in the Measures, Shape and Space strand. They were able to calculate arc lengths, areas of sectors, and the surface areas and volumes of 3-D figures. They could also apply their knowledge of angles and parallel lines, polygons, congruent triangles, similar triangles, quadrilaterals, Pythagoras' Theorem and trigonometry to solve problems. These students could apply the concepts of slope, midpoint and distance in the rectangular coordinate system. They were also able to use appropriate reasoning, geometrical properties and relevant theorems to complete more complex proofs and application problems.

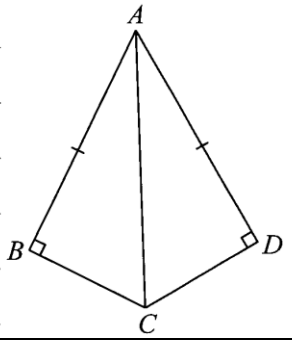
- Students with good performance had a good understanding of the organisation of data, presentation of data, measures of central tendency and probability. They were able to choose appropriate statistical charts to present data and interpret different types of statistical charts. These students could find the mean, mode/modal class and weighted mean from grouped or ungrouped data. They could also apply the listing method and concepts of probability to solve problems.

- The examples of work by these students are shown as follows:

Students were able to solve the problem correctly with complete and clear presentation.

Q40/M3
Ruby deposits $20 000 in a bank and the interest rate is 4% p.a. **compounded** yearly. Find the interest she will receive after 2 years.
Example of Student Work (Solve simple problems on compound interest, compounded yearly) 2年後她獲得的利息: $20\,000 \times (1+4\%)^2 - 20000$ $= \$1632$ ∴2年後她獲得 $1632 利息。

Students were able to make good use of the given conditions and solve the problem systematically.

Q44/M3
Example of Student Work (Use the conditions for congruent triangles to perform simple proofs) AB=AD(given) ∠ABC=∠ADC=90°(given) AC=AC(common side) ∵AB=AD, ∠ABC=∠ADC=90°, AC=AC ∴△ABC≅△ADC(RHS) 

Students were able to find the mean from a set of grouped data.

Q47/M4
Example of Student Work (Find the mean from a set of grouped data) (a) (b) The mean of the amounts of their daily pocket money $(20.5 \times 5 + 60.5 \times 7 + 100.5 \times 6 + 140.5 \times 4 + 180.5 \times 3) \div (5+7+6+4+3)$ $= 89.3$

Amount ($)	1 – 40	41 – 80	81 – 120	121 – 160	161 – 200
Class mark	20.5	60.5	100.5	140.5	180.5
Frequency	5	7	6	4	3

High-achieving students also had some common weaknesses, as follows:

- Some students were not able to calculate the relative error of a given measurement accurately.
- Some students were not able to distinguish between direct proportion and inverse proportion correctly.
- Some students were not able to use suitable estimation strategies to solve simple real-life problems.

Overview of Secondary 3 Student Performances in Mathematics in 2024, 2025 and 2026

The percentage of students achieving Basic Competency in the Territory-wide System Assessment this year was 78.3%.

The percentages of students achieving Basic Competency in 2024, 2025 and 2026 are listed below:

Table 8.6 Percentages of S.3 Students Achieving Mathematics Basic Competency in 2024, 2025 and 2026

Year	% of Students Achieving Mathematics Basic Competency
2024	79.0
2025	78.2
2026	78.3

A comparison of the strengths and weaknesses of S.3 students in 2024, 2025 and 2026 provides useful information for teachers to help students improve their learning. Table 8.7 provides an overview of student performances in each strand for these years.

Table 8.7 Overview of S.3 Student Performances in Mathematics in 2024, 2025 and 2026

Year / Number and Algebra	2024	2025	2026	Remarks
Strengths	• Students were good at performing mixed arithmetic operations of positive integers involving two levels and at most three pairs of brackets. • Students could use powers to express the repeated multiplication of a number and use repeated multiplication to express power of a number. • Students could demonstrate recognition of the ordering of integers on the number line. • Students could convert a positive number in scientific notations to an integer. • Students could find the value of a^n (where a and n are negative integers). • Students were good at determining whether a number satisfied a given inequality.	• Students were good at using powers to express the repeated multiplication of a number and use repeated multiplication to express the power of a number. • Students could demonstrate recognition of the ordering of integers on the number line. • Students could write down the next term of a sequence of odd numbers with several consecutive terms given. • Students performed well in converting a positive number in scientific notations to an integer or a decimal. • Students were good at determining whether a number satisfied a given inequality.	• Students were good at performing mixed arithmetic operations of positive integers involving two levels and at most three pairs of brackets • Students were good at using powers to express the repeated multiplication of a number and using repeated multiplication to express the power of a number. • Students could demonstrate recognition of the ordering of integers on a number line. • Students could write down the next term of a triangular number sequence with several consecutive terms given. • Students were good at determining whether a number satisfied a given inequality.	

Year / Number and Algebra	2024	2025	2026	Remarks
Weaknesses	• Many students were not able to find the least common multiple using the prime factorisation of two numbers. • Students' performance in using rounding down as an estimation strategy to solve simple real-life problems was weak. • Only some students could solve problems on simple interest. • Many students could not demonstrate recognition of powers. • Students' performance in distinguishing polynomials from algebraic expressions was not satisfactory. • Only some students could multiply two algebraic fractions (both the numerators and denominators being monomials).	• Only some students could perform prime factorisation of a positive integer, which is less than 200. • The minority of students were able to use rounding up as an estimation strategy to solve simple real-life problems. • Students' performance in solving problems on simple interest was not satisfactory. • Students showed weak understanding in distinguishing polynomials from algebraic expressions. • The majority of students could not demonstrate recognition of coefficients. • Only some students could perform operations of two algebraic fractions, both the numerators and denominators being monomials.	• Their performance in finding the least common multiple of two numbers expressed as products of prime factors was not satisfactory. • Students performed unsatisfactorily in carrying out prime factorisation of positive integers. • Only a minority of students could use suitable estimation strategies to solve simple real-life problems. • Students performed unsatisfactorily in using the identity of the perfect square to expand simple algebraic expressions.	• Students often mistakenly thought that 1 was a prime factor. • When solving problems involving estimation, students often carried out exact calculations or adopted inappropriate estimation strategies without considering the context of the questions.

Year / Measures, Shape and Space	2024	2025	2026	Remarks
Strengths	• Students were able to find the range of measures in measurements of given degrees of accuracy. • Students were able to calculate the volume of circular cones. • Students were good at using properties of angles at a point to find unknowns. • Students performed well in using the properties of parallelograms and rectangles to find unknowns. • Students were able to use Pythagoras' Theorem to find unknowns. • In a rectangular coordinate plane, the majority of students could mark the point with given coordinates. • Students were good at finding the cosine of angles.	• Students were able to demonstrate recognition of the sections of prisms. • Students were good at using the angle properties associated with parallel lines to find unknowns. • Students could demonstrate recognition of the properties of congruent triangles. • Students could use the properties of rhombuses to find unknowns. • Students did well in using the converse of Pythagoras' Theorem to identify right-angled triangles. • Students could use coordinates to represent the position of a point and mark the point with given coordinates.	• Students were able to demonstrate recognition of the concepts of right circular cones. • Students were able to demonstrate recognition of sections of pyramids. • Students were good at using angle properties associated with parallel lines to find unknowns. • Students were able to use the properties of parallelograms and rectangles to find unknowns. • In a rectangular coordinate plane, students were able to use coordinates to represent the position of a point.	

Year / Measures, Shape and Space	2024	2025	2026	Remarks
Weaknesses	• Students were weak in calculating maximum absolute errors when using a ruler for measurement. • Only some students could calculate percentage errors from given measurements. • Students' understanding of the concepts of right prisms and right pyramids was weak. • Many students were not able to use the conditions for isosceles triangles to perform simple proofs. • Students' performance in using the conditions for similar triangles to perform simple proofs needed improvement. • Students' performance in calculating the area of triangles in a rectangular coordinate plane was not satisfactory.	• Students were not able to find maximum absolute errors from the measuring tools. • Students showed unsatisfactory performance in calculating percentage errors from given measurements. • Only a small proportion of students could demonstrate recognition of the concepts of right prisms. • Many students could not use the relationships between sides and surface areas of similar 3-D figures to solve problems. • Students were weak in using the condition for isosceles triangles to perform simple proofs. • Many students could not find the image of a given point under a single transformation.	• Students were weak in calculating relative errors from given measurements. • Many students were unable to use the relationship between the sides and volumes of similar 3-D figures to solve problems. • Students demonstrated weak recognition of the concepts of polygons and regular polygons. • Students performed unsatisfactorily in using the condition for isosceles triangles to perform simple proofs. • Students performed unsatisfactorily in calculating the area of polygons in a rectangular coordinate plane.	• Students often confused the concepts of maximum absolute error, relative error and percentage error when solving problems involving errors in measurement. • In geometric proof questions, students were sometimes unable to provide complete and valid reasoning, and failed to state the geometrical properties used clearly.

Year / Data Handling	2024	2025	2026	Remarks
Strengths	• Students were able to organise the same set of data by different grouping methods. • Students performed satisfactorily in interpreting stem-and-leaf plots, constructing cumulative frequency polygons, and choosing appropriate statistical charts to present data. • Many students could find mean and median from a set of ungrouped data.	• Students were able to organise the same set of data by different grouping methods. • Students could interpret stem-and-leaf diagrams and construct cumulative frequency polygons. • Students were able to find mean and median from a set of ungrouped data and find modal class from a set of grouped data. • Students were able to calculate the probability by listing.	• Students were able to interpret histograms and construct cumulative frequency polygons. • Students were able to find the mean and mode from a set of ungrouped data. • Students were able to calculate the weighted mean of a set of data. • Students were able to calculate the probability by listing.	
Weaknesses	• Students' performance in reading off data from statistical charts representing two different sets of data was not satisfactory. • Only some students could indicate the abuses from examples of abuses of mean.	• Only some students could read off data from statistical charts representing two different sets of data. • Students' performance in indicating the abuses from examples of abuses of mode was weak.	• Students performed unsatisfactorily in indicating the abuses from examples of abuses of mean.	• When dealing with examples involving abuses of mean, students often failed to provide sufficient justification as to why the use of the mean was misleading.