# MATHEMATICS SYLLABUS D (MAURITIUS)

**Paper 4029/01**
**Paper 1**

## Key messages

This is a non-calculator paper and accuracy in basic number operations is essential. A fluency in computational skills and mathematical procedures is of utmost importance. Candidates are strongly recommended to show all their workings and write their answers clearly in the answer spaces provided. Candidates are also encouraged to pay attention to instructions given within a question, such as when answers are required in a specific form (in simplest form, as a mixed number or in standard form).

## General comments

The performance of candidates in this paper was generally good with many candidates demonstrating sound understanding of most aspects of the syllabus. The majority of candidates attempted all the questions. Incorrect simplification was often seen in **Questions 4, 7** and **13**. **Questions 15, 19, 21** and **23** and parts of **Questions 9, 17, 22** and **26** proved to be most challenging to candidates.

Questions that were often left unattempt by candidates were: 9**(d)**, 15, 19, 21, 23**(b)**, 26**(c)**.

## Comments on specific questions

### Question 1

Most candidates answered this question correctly.

However, instead of rounding off to 3 decimal places, some candidates moved the decimal point by 3 places, giving the wrong answer 43078.62 or 43079.

Some candidates gave the answer to 3 significant figures instead of writing the number to 3 decimal places.

### Question 2

Most candidates found the correct increase $19°C$, however the two most common wrong answers were $5°C$ (from $12-7$) and $-19°C$ from $(-7-12)$.

### Question 3

Candidates had difficulty converting $\frac{2}{3}$ to the appropriate decimal number to score the full marks. Others took to the wrong ordering of 0.6 and 0.606 and scored partial marks or did not score at all. A few cases of descending order were noted even though the answer space clearly showed 'smallest' first.

### Question 4

**(a)** Most candidates scored marks for the correct answer. A small number of candidates did not completely simplify the answer and left it as $\frac{t^7}{t^{10}}$. Those dealing with the negative power, gave $t^3$ as an answer.

**(b)** Most candidates answered this question well.
A common wrong answer was: $36, \sqrt{36}$.

**Question 5**

**(a)** Very few candidates scored full marks. Many scored a partial mark for angle $180^o$ seen. Many candidates could not perform the multiplication correctly. A few candidates considered the wrong total frequency, 90. The most common wrong working seen were $\frac{45}{100} \times 360$, $\frac{20}{100} \times 360$ and $\frac{10}{100} \times 360$.

**(b)** Many candidates scored partial marks in this part. The sectors were not drawn accurately in many cases. Quite a large number of candidates were not able to draw an angle of $80°$ and $40°$ within a tolerance range of $2°$.

**Question 6**

This question was generally well answered with the correct answer $\$680$. Candidates could successfully demonstrate the correct skills for finding the correct answer. However, for those who did not score full marks the most common arithmetic slip was: $(100 - 15)\% = 75\%$. Some candidates struggled working out $85 \times 8$ showing clearly the dependency of candidates using a calculator for simple multiplication. Some candidates did obtain 120 but did not continue in subtracting it from $800 to obtain the correct value. A few added 120 to 800.

**Question 7**

A large number of candidates scored full marks in this question.

Most candidates used the correct method of writing the two fractions with the common denominators of 12 or 24, reaching $\frac{19}{12}$ or $\frac{38}{24}$. Some candidates left their answer as the improper fraction $\frac{19}{12}$ or gave the answer as $1\frac{14}{24}$.

**Question 8**

Many candidates were successful in reaching the correct answer 3 hours and 15 minutes. A partial mark was scored for finding $\frac{13}{4}$.

Most common wrong answers were: 3 hours 25 minutes, 0 hours 52 minutes or 192 mins.

**Question 9**

**(a)** Most candidates answered correctly by drawing the appropriate pattern.

**(b)** The majority of the candidates correctly completed the table.

**(c)** Candidates struggled to reach the final answer of '72' in this question. Many candidates left the answer space blank, while others filled it with a random wrong value.

**(d)** Very few candidates could successfully answer this part of the question. Some candidates who reached a quadratic expression scored partial marks.

**Question 10**

**(a)** Many candidates were able to measure the required length accurately and use the given scale to find the radius in meters. However, in some scripts 16.25 was seen as the final answer obtained by taking the length of BC or CD and multiplying by 2.5.

**(b) (i)** Many correct angle bisectors were seen. A few candidates drew an angle bisector without showing the construction lines/arcs.

A small number of candidates attempted to bisect the sides AB, AE, or DE.

**(ii)** Many candidates identified the correct region.

In some cases, candidates wrongly shaded the required part, or their shading did not cover the entire required region.

**(c)** Most candidates were able to score full marks in this part. They were required to perform the multiplication $(8 \times \$30.75)$.

Wrong answers seen were: \$246.45, \$245.6.

**Question 11**

Many candidates answered this question correctly demonstrating good understanding of factorisation of algebraic expressions. A few candidates scored partial marks when they could not reach the final answer.

A few candidates treated the expression like an equation and solved it.

The common wrong answer $2m(m-7)$ was seen.

**Question 12**

Many candidates could not identify the irrational number. In many cases, candidates wrote all the six numbers in the answer space.

The most common wrong answers were: $\sqrt{4}$ and $2^0$.

**Question 13**

Most candidates were successful in evaluating the operation and wrote their answers in standard form. Common wrong answers were: $42 \times 10^7$, $-3 \times 10^1$.

**Question 14**

Most candidates answered correctly. A few candidates omitted '7' in their answer. The following wrong answers were quite common: $2^4 \times 3^3 \times 5 \times 7$, $2^3 \times 3^2 \times 5$.

**Question 15**

Many candidates did not score for this question. The methods used were either wrong or incomplete. Some scripts used the following wrong formula: $\frac{(n-1) \times 180}{n} = 160$. In many cases, the denominator $n$ was missing from the formula. Those who opted for the exterior angle method, reached 20° using $180° - 160°$, but stopped their workings instead of dividing $360°$ by the '20' to get the correct final answer '18'. Some candidates divided $160°$ by $20°$.

**Question 16**

**(a)** Many scripts were seen with the correct image. Some candidates lost marks due to wrong positioning (either for vertical or for horizontal translation). Those who lost full marks failed to recall that translation does not impact the orientation of the shape.

**(b)** This part proved to be challenging for many candidates. Some were able to identify rotation as the correct transformation but were unable to state the angle and direction of rotation. Consequently, the correct coordinate of the centre of rotation was rarely seen. In some cases, the coordinates were given in the form of a vector. Many candidates gave more than one transformation as an answer, for e.g. rotation followed by a translation.

**Question 17**

**(a)** This question was challenging for many candidates. They were expected to write two of the three inequalities that defined the shaded triangle. Only a few candidates obtained both inequalities. They struggled to find the correct equation of the inclined line or were confused with the inequality signs while writing the final answer. In some cases, candidates wrote the given inequality as an answer solely by reversing its inequality sign. Common wrong answers were:
$x < 4$ , $y \leqslant -\frac{3}{2}x + 1$, $y < 4$ .

**(b)** Many candidates failed to get $20\,\text{cm}^2$ for the correct area of the given triangle. It was noted that many candidates divided the figure into two triangles to find individual areas and then add them up to obtain a value. In most of the cases, they made mistakes when substituting for the base of one of their triangles and this gave them an incorrect value.

A common wrong answer seen was 18, coming from $\frac{1}{2}\times 4\times 4+\frac{1}{2}\times 4\times 5$ rather than $\frac{1}{2}\times 4\times 4+\frac{1}{2}\times 4\times 6$.

**Question 18**

**(a)** This part was challenging. Candidates were expected to read the lower and upper quartile values from the graph to find the interquartile range which was $95g$ . Many candidates scored the part mark the for writing 300 for the upper quartile however the value of the lower quartile was quite rare as candidates required more advance reading skills to identify the value. Common incorrect values for $UQ$ and $LQ$ respectively were: 350 and 225.

**(b)** Many candidates were able to score marks for either (60 – 24) or for 36 seen. In some cases, 60 – 24 was wrongly computed. Some read the value 24 directly from the Cumulative Frequency curve to obtain 225 as their answer.

**Question 19**

A challenging question for most candidates. The correct answer of 6 cm was quite rare. Candidates lost marks as they struggled to reach the linear ratio of $3:4$ from starting with the volume ratio. No marks was common and in many cases, candidates left the answer space blank. A few candidates did score 2 marks for the correct answer in the answer space but with no working at all. Most common wrong answers were $3, 3.375$ and $4$. The most common wrong calculation seen was: $\frac{w}{8}=\frac{270}{640}$.

**Question 20**

**(a)** The simplification of numbers written in index form was problematic for many candidates. If the numerical part was correctly worked out, they struggled with the algebraic part. Some candidates did not reach the completely simplified answers and answers like $2^3\times a^{15}$, $2^3a^{15}$ or $(8a)^{15}$ were noted. It appears that they had difficulty in working with the fractional index, $(16)^{\frac{3}{4}}$.

**(b)** Many candidates were able to correctly expand the expression to reach $8c^2 - 6cd + 36cd - 27d^2$. However, many struggled to simplify the expression and gave the wrong answer $8c^2 - 30cd - 27d^2$ or $8c^2 - 42cd - 27d^2$.

**Question 21**

A challenging question for most candidates who struggled to find the original matrix *A* and use it to write an equation in *k*. Part marks were rarely seen. Candidates who gained marks, did so for the equation $20 = km + 7$ and/or for the matrix $\begin{pmatrix} k & -7 \\ 1 & m \end{pmatrix}$.

Common wrong answers were: $20 = km - 7$ resulting in $km = 27$.

**Question 22**

**(a)** Many correct answers were seen. Among those who were unsuccessful, a common mistake seen was $\frac{(-21-1)}{2} = \frac{-20}{2}$, resulting in wrong answer, $-10$.

**(b)** Many candidates were able to find the inverse function correctly. A few gave their answer as $\frac{2y+1}{3}$ rather than $\frac{2x+1}{3}$. A few candidates confused the inverse function with the reciprocal of the function and gave the answer as $\frac{2}{3x-1}$.

**(c)** This part proved difficult for a large number of candidates and very few scored full marks. A common answer was 2. The common error seen was wrongly rearranging $\frac{3\left(\frac{9}{25}\right)-1}{2} = 5^x$ as $3\left(\frac{9}{25}\right)-1 = 10^x$

**Question 23**

**(a)** Most candidates earned only part marks for this part. Most common correct answers seen were (3 and 7) and (4) correctly positioned on the Venn diagram. Elements (8 and 2) were rarely seen on the diagram.

**(b)** Most candidates found this question challenging and either left the answer space blank or gave an incorrect answer. For those who tried successfully, a few correct equivalents were seen other than the two provided in the mark scheme. A common wrong answer was: $(S \cup D)'$.

**Question 24**

**(a)** Most candidates appeared to be at ease with this question and consequently many correct answers were noted. Some candidates worked out the gradient instead of the mid-point.

**(b)** Most candidates found this 4-mark question challenging and marks were lost at different stages of the working. Finding the gradient of PQ was a generally well done. Common errors seen included mixed up values of *x* and of *y* or the incorrect use of the gradient formula. Candidates lost marks when finding the gradient of the perpendicular when they took the reciprocal of the gradient of PQ but then missed out reversing the sign or missed the reciprocal but did change the sign. A good many candidates lost marks when they used the coordinates of the mid-point (or Q) instead of the coordinates of point *P*.

Wrong computations seen were: $-3-(-1)$

**Question 25**

Most candidates could attempt this question without much difficulty and scored full marks. Very few scripts had free hand drawings. In many scripts the last vertical line was missing to complete the rectangle.

Moreover, some candidates were unfamiliar with the process of finding the frequency density and a common mistake was to assume that since $\frac{30}{5} = 6$, the other frequency densities would be $\frac{25}{5}$, $\frac{35}{5}$ and $\frac{20}{5}$.

**Question 26**

**(a)** Most candidates successfully attempted this question.

**(b)** Common wrong answers were: $a - 2b, a + 2b$

**(c)** Most candidates found this part quite challenging. Many scored partial marks for the correct route seen.

**(d)** Many candidates did not attempt this part. Among those who did attempt, the correct answer was very rare. Many candidates were unable to realise that a numerical value of k was needed, and they gave vectors in their answer.

# MATHEMATICS SYLLABUS D (MAURITIUS)

**Paper 4029/02**
**Paper 2**

## Key messages

In order to do well in this paper, candidates need to

- Have covered the whole syllabus.
- Remember necessary formulae and facts.
- Recognise and carry out correctly the appropriate mathematical procedures for a given situation.
- Perform calculations accurately.
- Show clearly all necessary workings in the appropriate space provided.

## General comments

There were a number of well-presented scripts of good standard. Scripts covered a wide range of marks. Although some candidates did not attempt all the questions, it appears that most candidates had sufficient time to complete the paper.

In some cases, candidates gave inaccurate final answers due to premature rounding of intermediate steps. Candidates are advised to avoid premature rounding and to ensure that their final answers are given to three significant figures or to the degree of accuracy specified in the question.

Candidates are advised to be particularly careful with the presentation of their workings. Workings must be clear, concise and well presented to avoid any loss of marks. When required to give an explanation or justification, such as in **Question 2(a)(iv)** candidates must ensure that they use simple, clear and appropriate mathematical terms. Candidates are encouraged to read instructions carefully.

**Questions 1(a), 1(c), 4(a), 5(a), 6(a), 7(a), 7(b), 10(c)** were done well by candidates whereas **Questions 1(e), 2(b), 4(c), 5(c), 6(d), 9(a), 10(a), 10(b)** proved to be challenging for many candidates.

## Comments on specific questions

### Question 1

**(a)** This part was well answered by the majority. A few candidates calculated 84 per cent of 240 instead.

**(b)** The correct answer was commonly seen. Many candidates who were not successful, earned a partial mark from the correct conversion 1litre = 1000 ml.

**(c)** Most candidates scored full marks.

However, in a few cases the following mistake was noted:

1.5 = 125 **k** leading to **k** = 125/1.5 = 83.3.

**(d)** The common mistake seen was 62 per cent of 285 giving an incorrect answer of 176.7.

**(e)** Only a few candidates were familiar in dealing with upper and lower bounds and scored full marks. The most common wrong answers noted were 152.5 (U.B bag – U.B nuts) and 147.5 (L.B bag – L.B nuts). It was also found that candidates subtracted 350 from 500 and then applied the bounds.

**Question 2**

**(a) (i)** Most candidates plotted the four points accurately.

**(ii)** The majority of candidates were successful in this part and successfully drew the line of best fit.

**(iii)** Many candidates were able to give a correct estimate of the value of a 7-year-old car.

**(iv)** Many correct explanations were seen. Common incorrect answers were:

- the variables are negatively correlated
- the car was too old

**(b) (i)** This part was generally well answered. An answer of $\frac{28}{5}$ or 0.56 was also seen.

**(ii)** The most common incorrect answer was $40 < d \leqslant 50$.

**(iii)** Many candidates were able to recall that the formula $\frac{\sum xf}{\sum f}$ had to be used to find the estimate of the mean and were successful in producing the final answer. However, a few candidates used the class widths instead of the middle value of the corresponding intervals of $x$, resulting in the answer 23.4.

**Question 3**

**(a) (i)** This part was well answered by most candidates.

**(ii)** Candidates applied the correct approach to obtain the time taken (8.1 minutes), but many failed to reach the final answer. They incorrectly converted 0.1 minutes as 10 seconds instead of 6 seconds.

**(b)** Many candidates started working with the assumption that the height of the cross section was 70 cm. Among the few candidates who attempted to find the height using Pythagoras theorem, most of them used 30 instead of 15.

Most candidates gained partial marks for calculating the area of the square base and lateral faces.

**Question 4**

**(a)** Mostly well answered.

**(b)** A few candidates converted \$150 into euros, but most of the candidates converted €140 into dollars correctly and a few candidates multiplied by 0.91. Some rounded \$3.846 and lost the accuracy mark. Answers like 3.84, 3.9 and 4 were seen.

**(c)** The common mistake by some candidates were to equate the correct compound formula to the total interest \$21.86 instead of \$621.86. Others used simple interest formula to arrive at the correct answer thus did not score any marks.

**Question 5**

**(a)** Most candidates gave the correct probability.

**(b)** Many candidates understood that they had to find the probability of obtaining a card showing a number 1 and square it. Some candidates added the two fractions instead.

**(c)** Many candidates realised that the experiment was carried out without replacement and managed to reach the correct answer. Few candidates used the sample space correctly to obtain the answer. In some cases, candidates added the probabilities instead of multiplying.

**Question 6**

**(a)** The table was correctly completed by a large number of candidates.

**(b)** Most of the time the points were plotted accurately and resulted in smooth curves.

**(c)** A vast majority of candidates did not understand that the value of k was the *y*-coordinate of the maximum and minimum points of the graph. –2 and 0 was commonly seen.

**(d)** Most of the candidates found this part to be very challenging. Blank answer spaces were noted quite often. Those who made an attempt, drew the wrong line $y = 2x - 4$ or $y = -1$.

**Question 7**

**(a)** Well answered by most candidates.

**(b)** Well answered by most candidates.

**(c)** Many candidates provided the appropriate list of integers for the inequality, but some included $-1.5$ or 3 in their set of values.

**(d)** This question was successfully done by many candidates. Those who did not score full marks usually had a partial mark for reaching $3xy = 4y - x$.

**(e)** This part was well attempted by most candidates. However, a few candidates were not able to recognise that the expression in the numerator $3(4x^2 - y^2)$ could be further factorised using the difference of two squares.

**Question 8**

**(a)** Many candidates were able to identify the correct angle but gave an invalid reason.

**(b)** The complete ratio of the corresponding sides in the similar triangles ADE and ABC was wrongly identified. The ratio of $\frac{5.6}{9.8}$ was commonly seen.

**(c)** The use of the cosine rule to find angle DAE was commonly seen.

**(d)** The sine formula for the area of a triangle was well quoted and used correctly by many candidates.

**Question 9**

**(a)** Many responses were seen for angle DOC but candidates struggled to correctly use the tangent ratio to find the radius.

**(b)** Many candidates were able to equate the correct formula for the length of an arc to 7.3 to obtain the radius. Those who were not successful, used the radius as 7.3 to find the area of the major sector.

**Question 10**

**(a)** Most of the candidates were not able to use the given information to construct the correct expression for the mass of apples. Terms like $\frac{9}{x}$ and $900x$ were commonly seen.

**(b)** Candidates struggled here, largely because many candidates were unable to produce the correct term, $\frac{900}{x+40}$, for the mass of pears, and go on to form the correct equation.

**(c)** There were many accurate solutions of the quadratic equation.

**(d)** Many candidates gave 460 cents as the answer for the total amount coming from (1.5 × 200 + 0.8 × 200) ignoring the fact that the cost of pears was 40 cents/kg more than apples.