Education Bureau
Territory-wide System Assessment 2024
Secondary 3 Mathematics
Marking Scheme

Note (for Section B and C of each sub-paper):

*Mark for Answer:
    (1) The Mark for Answer may be given when there is a correct answer without any work shown.
    (2) If the work shown is incorrect, the Mark for Answer will not be given.
    (3) If the work shown is poorly presented but there is a correct answer, the Mark for Answer may be given.

**Mark for Presentation:
    (1) If the work shown is correct but the answer is incorrect, the Mark for Presentation may be given.
    (2) If the work shown is incorrect, the Mark for Presentation will not be given.
    (3) If the numerical value of the answer is correct but not the approximate value as required by the question, the Mark for Presentation will not be given.
    (4) The Mark for Presentation may include overall work such as mathematical expressions, units, written explanations, use of symbols, etc.

r.t. *xxx* means "accept answers which can be rounded to *xxx*".

Steps that may be skipped are shown in shade.

Alternative suggested answers are shown in boxes.

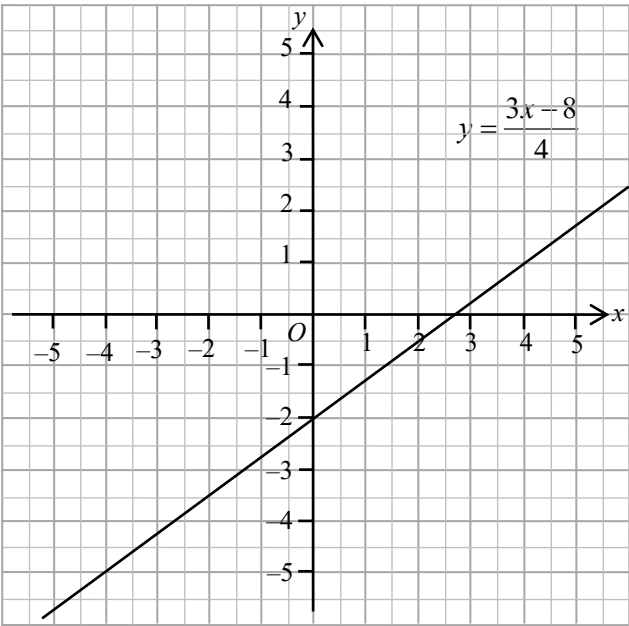Section A – Sub-paper 1 (9ME1) (1 mark each)

1. D (9ME4-1)
2. D (9ME4-2)
3. B
4. A (9ME2-5)
5. C (9ME4-4)
6. A (9ME4-5)
7. A (9ME4-7)
8. C
9. C
10. B (9ME2-11)
11. C (9ME4-12)
12. C
13. B (9ME2-13)
14. B (9ME2-14)
15. A (9ME2-16)
16. D
17. D
18. B (9ME2-18)
19. A (9ME4-19)
20. D (9ME2-20)

Section B – Sub-paper 1 (9ME1)

Question Number	Suggested Answers	Marks	Notes
21.	20	1	
22.	-5	1	
23.	The restaurant sold ___1 200___ lunch sets yesterday.	1	No need to consider unit
24. (9ME2-23)	(i) Inverse proportion (ii) Direct proportion	1	Must be all correct
25. (9ME4-25)	Number of apples : Number of mangoes = ___8___ : ___7___	1	
26. (9ME2-26)	The diameter = ___4×10^{-5}___ m	1	No need to consider unit
27. (9ME4-28)	$3x^2 + x - 10$	1	
28.	$(2x + 1)(x + 3)$ / $(x + 3)(2x + 1)$	1	
29. (9ME4-29)	$(x - 1)^2$	1	
30. (9ME4-30)	$a = \dfrac{25}{12}$	1	
31. (9ME4-31)	$x \leq -4$	1	
32.	Solid Q and Solid R	1	Must be all correct
33.	___$ABCD$___	1	
34.	(a) $m =$ ___9___ (b) $n =$ ___51___	1	Must be all correct No need to consider unit
35.	P and Q	1	Must be all correct
36. (9ME2-35)	$x =$ ___$62°$___	1	No need to consider unit

Question Number	Suggested Answers	Marks	Notes
37. (9ME4-37)	(a) The basketball team played ___20___ matches last year. (b) The lowest score of the basketball team in the matches last year was ___40___ . (c) The median score of the basketball team in the matches last year was ___67___ .	1 (37a) 1 (37b) 1 (37c)	No need to consider unit
38. (9ME2-39)	(a) The school has ___400___ students. (b) There were ___70___ students who spent less than 3 hours on physical exercise last week.	1 (38a) 1 (38b)	No need to consider unit
39.	The weighted mean price index of these four types of household expenditure of the city in the previous year is ___55.1___ .	1	No need to consider unit

Section C – Sub-paper 1 (9ME1)

Question Number	Suggested Answers	Marks	Notes
40.	Annual interest rate $= \dfrac{1\,000}{5\,000 \times 4}$ $= 5\%$	1 (40-1) 1* (40-2) 1** (40-3)	
41. (9ME4-42)	<table><tr><td>x</td><td>-4</td><td>0</td><td>4</td></tr><tr><td>y</td><td>-5</td><td>-2</td><td>1</td></tr></table> $y = \dfrac{3x-8}{4}$	1* (41-1) 1 (41-2) 1* (41-3)	Must be all correct In case the data in the above table is incorrect, students can still use the ordered pairs to draw a straight line. The line must pass through $(0, -2)$ and the range of x must include the values from -4 to 4. Correct graph (include: correct position, use ruler to draw the line, pass through the 3 correct points and extend two ends of the line) If the table is incomplete but no mistakes are found and the graph is correct, $(0, 1, 1)$ can be given.

Question Number	Suggested Answers	Marks	Notes
42.	(a) $(x^5)^3$ $= x^{5 \times 3}$ $= x^{15}$ (b) $x^{-2}(x^5)^3$ $= x^{-2}x^{15}$ $= \dfrac{x^{15}}{x^2}$ $= x^{13}$	1* (42a) 1 (42b1) 1* (42b2)	 using $a^{-m} = \dfrac{1}{a^m}$ Correct answer (getting marks 1 1)
43.	$x = 2\pi(10)\left(\dfrac{140°}{360°}\right)$ ≈ 24.434610 $= 24.4$ cm (corr. to 3 sig. fig.)	1 (43-1) 1* (43-2) 1** (43-3)	 r.t. 24.4 cm
44. (9ME2-43)	Let the base diameter of Solid A is x cm $\left(\dfrac{x}{12}\right)^2 = \dfrac{200}{1800}$ $x = 4$ $\therefore$ The base diameter of Solid A is 4 cm.	1 (44-1) 1* (44-2) 1** (44-3)	
45.	$\angle AEC + \angle CED = \angle FEB$ (vert. opp. $\angle$s) $\angle AEC + 73° = 115°$ $\angle AEC = 42°$ $\because \angle AEC = \angle ECD = 42°$ $\therefore AB \parallel CD$ (alt. $\angle$s equal)		Or other correct proofs

Conditions		
(1) Any correct proof with correct reasons	3	
(2) Any correct proof with poor presentation, missing reasons or inappropriate reasons	2	
(3) Incomplete proof with any one correct statement and one corresponding reason	1	
(4) Incomplete proof	0	

Question Number	Suggested Answers	Marks	Notes
46.	**(a)** 	1* (46a)	Must be all correct

(a)

Recovery time less than (hours)	24.5	48.5	72.5	96.5	120.5	144.5	168.5
Cumulative frequency	1	5	14	25	30	33	35

(b)

Recovery time of 35 patients suffering from influenza

Marks:
1 (46b1)

The remaining 3 points are indicated according to the table above. The points are connected by line segments to form a cumulative frequency polygon

1* (46b2)

Correct cumulative frequency polygon (including correct indication of all 3 points and the points are connected by line segments)

Question Number	Suggested Answers	Marks		Notes
47.	Half of the number of months in a year $= 6$ The number of monthly electricity consumptions more than $8\,000$ kWh $= 5$ < 6 $\therefore$ It is not true that over half of the number of monthly electricity consumptions were more than $8\,000$ kWh. $\therefore$ I **disagree** with the manager.	0	0	◆ Without any reasonable explanation ◆ Conclusion is incorrect
		1	0	◆ Explanation is reasonable but incomplete ◆ Explanation is reasonable but no conclusion is drawn
		1	1	◆ Explanation supported by data is reasonable and the conclusion is correct