

**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  $xxx$ ” .

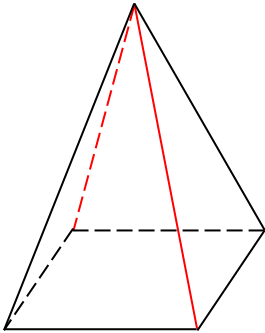
Steps that may be skipped are shown in **shade**.

Alternative suggested answers are shown in **boxes**.

## Section A – Sub-paper 2 (9ME2) (1 mark each)

1. A
2. D (9ME3-2)
3. C
4. D (9ME3-3)
5. A (9ME1-4)
6. D
7. C
8. A (9ME3-8)
9. A (9ME3-9)
10. C
11. B (9ME1-10)
12. C
13. B (9ME1-13)
14. B (9ME1-14)
15. C (9ME3-16)
16. A (9ME1-15)
17. D
18. B (9ME1-18)
19. B (9ME3-19)
20. D (9ME1-20)

## Section B – Sub-paper 2 (9ME2)

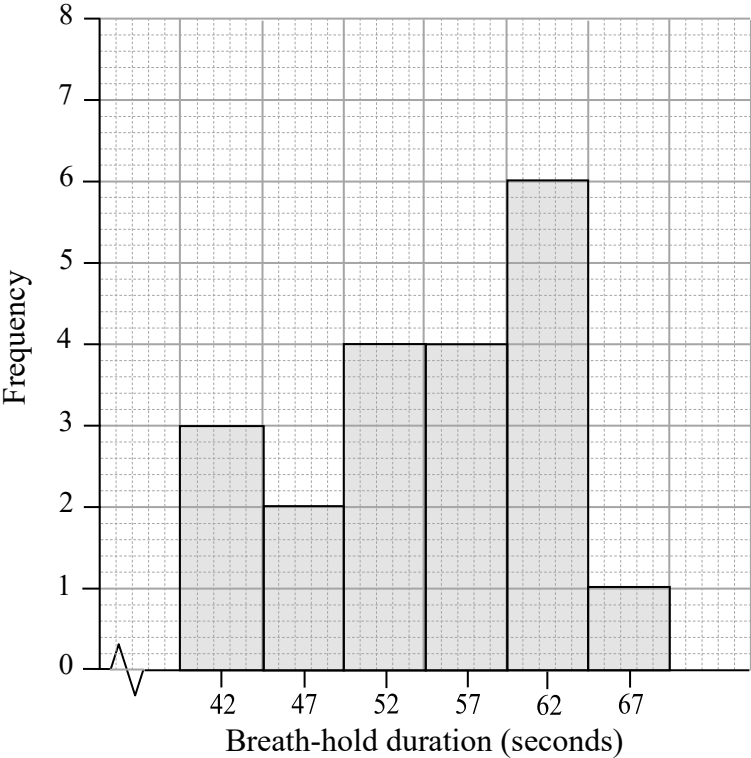
Question Number	Suggested Answers	Marks	Notes
21.	$A = -4$ $B = 0$ $C = 8 / +8$	1	Must be all correct
22. (9ME3-22)	0.05	1	
23. (9ME1-24)	(i) Inverse proportion (ii) Direct proportion	1	Must be all correct
24.	$x = \underline{3}$	1	
25.	$\frac{1}{100}$	1	
26. (9ME1-26)	The diameter = $\underline{4 \times 10^{-5}}$ m	1	No need to consider unit
27.	$3x + 4y$ / $4y + 3x$	1	
28.	$4x(1 - 2x)$	1	
29. (9ME3-27)	$36x^2 - 1$	1	
30. (9ME3-28)	$\frac{25}{4}$	1	
31.	The maximum absolute error of the measurement is $\underline{0.25 \text{ cm}}$ .	1	No need to consider unit
32.		1	Must be all correct
33.	$x = \underline{92^\circ}$	1	No need to consider unit
34.	(a) $x = \underline{32}$ (b) $y = \underline{6}$	1	Must be all correct No need to consider unit
35. (9ME1-36)	$x = \underline{62^\circ}$	1	No need to consider unit
36.	$x = \underline{52.7}$	1	r.t. 52.7 No need to consider unit

Question Number	Suggested Answers	Marks	Notes																								
37. (9ME3-36)	<table border="1" style="margin: 0 auto;"> <thead> <tr> <th colspan="2" style="text-align: center;">Table 1</th> </tr> <tr> <th style="width: 50%;">Number of push-ups</th> <th style="width: 50%;">Frequency</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0 – 19</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: center;">20 – 39</td> <td style="text-align: center;"><b>7</b></td> </tr> <tr> <td style="text-align: center;">40 – 59</td> <td style="text-align: center;">11</td> </tr> </tbody> </table> <table border="1" style="margin: 0 auto;"> <thead> <tr> <th colspan="2" style="text-align: center;">Table 2</th> </tr> <tr> <th style="width: 50%;">Number of push-ups</th> <th style="width: 50%;">Frequency</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0 – 11</td> <td style="text-align: center;">1</td> </tr> <tr> <td style="text-align: center;">12 – 23</td> <td style="text-align: center;"><b>2</b></td> </tr> <tr> <td style="text-align: center;">24 – 35</td> <td style="text-align: center;">5</td> </tr> <tr> <td style="text-align: center;">36 – 47</td> <td style="text-align: center;">7</td> </tr> <tr> <td style="text-align: center;">48 – 59</td> <td style="text-align: center;"><b>5</b></td> </tr> </tbody> </table>	Table 1		Number of push-ups	Frequency	0 – 19	2	20 – 39	<b>7</b>	40 – 59	11	Table 2		Number of push-ups	Frequency	0 – 11	1	12 – 23	<b>2</b>	24 – 35	5	36 – 47	7	48 – 59	<b>5</b>	<p>1(37-1)</p>           <p>1(37-2)</p>	
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38. (9ME3-37)	(a) The total profit from the food boxes sold last week <u>5 920</u> dollars. (b) The mean profit of each food box sold last Thursday was <u>25</u> dollars.	<p>1(38a)</p>  <p>1(38b)</p>	<p>No need to consider unit</p>																								
39. (9ME1-38)	(a) The school has <u>400</u> students. (b) There were <u>70</u> students who spent less than 3 hours on physical exercise last week.	<p>1 (39a)</p>  <p>1 (39b)</p>																									

## Section C – Sub-paper 2 (9ME2)

Question Number	Suggested Answers	Marks	Notes
40.	<p>The newborn population of the city in 2023</p> $= 25\,000 \times (1 + 2\%)^2$ $= 26\,010$ <p>or</p> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 2px;"><math>25\,000 \times 1.02 = 25\,500</math></div> <div style="border: 1px solid black; padding: 2px; width: fit-content; margin-bottom: 2px;"><math>25\,500 \times 1.02 = 26\,010</math></div> <div style="border: 1px solid black; padding: 2px; width: fit-content;"><p>The newborn population of the city in 2023 is 26 010.</p></div>	<p>1 (40-1) 1* (40-2) 1** (40-3)</p> <p><span style="border: 1px solid black; padding: 0 2px;">1</span> (40-1) <span style="border: 1px solid black; padding: 0 2px;">1*</span> (40-2) <span style="border: 1px solid black; padding: 0 2px;">1**</span> (40-3)</p>	<div style="border: 1px solid black; padding: 2px; width: fit-content; margin-left: auto; margin-right: auto;">Correct method (multiply 1.02 twice)</div>
41.	<p>Jason's wage for this week</p> $= \frac{240 \times 18}{4}$ $= \$1\,080$	<p>1 (41-1) 1* (41-2) 1** (41-3)</p>	
42. (9ME3-46)	$\begin{cases} 2x + 5y = 6 & \dots(1) \\ x - 5y = 18 & \dots(2) \end{cases}$ <p>(1) + (2),</p> $2x + x = 6 + 18$ $3x = 24$ $x = 8$ <p>Substitute <math>x = 8</math> into (2),</p> $8 - 5y = 18$ $y = -2$	<p>1 (42-1) 1* (42-2) 1 (42-3) 1* (42-4)</p>	<p>Correct method (eliminating one of the variables)</p> <p>Correct value of <math>x</math> (or <math>y</math>)</p> <p>Correct method</p> <p>Both values are correct</p>

Question Number	Suggested Answers	Marks	Notes
43. (9ME1-44)	Let the base diameter of Solid $A$ is $x$ cm. $\left(\frac{x}{12}\right)^2 = \frac{200}{1800}$ $x = 4$ $\therefore$ The base diameter of Solid $A$ is 4 cm.	1 (43-1) 1* (43-2) 1** (43-3)	
44.	$x + x + 23^\circ = 107^\circ$ $x = 42^\circ$	1 (44-1) 1* (44-2)	No need to consider unit
45.	$\angle ACB = 180^\circ - 124^\circ$ (adj. $\angle$ s on st. line) $= 56^\circ$ $\therefore \angle ABC = \angle ACB = 56^\circ$ $\therefore AC = AB$ (side opp. eq. $\angle$ s) $\therefore \triangle ABC$ is an isosceles triangle		Or other correct proofs
<b>Conditions</b>			
	(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	
46. (9ME3-45)	The area of $\triangle ABC$ $= (10 - 2) \times (2 - (-4)) \div 2$ $= 24$ sq. units	1 (46-1) 1* (46-2) 1** (46-3)	Or other correct methods

Question Number	Suggested Answers	Marks	Notes																												
47.	<table border="1" data-bbox="260 302 1106 674"> <thead> <tr> <th>Duration (seconds)</th> <th>Class boundaries (seconds)</th> <th>Class mark (seconds)</th> <th>Frequency</th> </tr> </thead> <tbody> <tr> <td>40 – 44</td> <td>39.5 – 44.5</td> <td>42</td> <td>3</td> </tr> <tr> <td>45 – 49</td> <td>44.5 – 49.5</td> <td>47</td> <td>2</td> </tr> <tr> <td>50 – 54</td> <td>49.5 – 54.5</td> <td>52</td> <td>4</td> </tr> <tr> <td>55 – 59</td> <td>54.5 – 59.5</td> <td>57</td> <td>4</td> </tr> <tr> <td>60 – 64</td> <td>59.5 – 64.5</td> <td>62</td> <td>6</td> </tr> <tr> <td>65 – 69</td> <td>64.5 – 69.5</td> <td>67</td> <td>1</td> </tr> </tbody> </table> <p data-bbox="406 725 1018 797" style="text-align: center;"><b>Training records of breath-hold duration under water by 20 swimming team members</b></p> 	Duration (seconds)	Class boundaries (seconds)	Class mark (seconds)	Frequency	40 – 44	39.5 – 44.5	42	3	45 – 49	44.5 – 49.5	47	2	50 – 54	49.5 – 54.5	52	4	55 – 59	54.5 – 59.5	57	4	60 – 64	59.5 – 64.5	62	6	65 – 69	64.5 – 69.5	67	1	<p data-bbox="1150 439 1222 506" style="text-align: center;">1* (47-1)</p> <p data-bbox="1142 1151 1230 1189" style="text-align: center;">1 (47-2)</p>	<p data-bbox="1265 439 1414 506" style="text-align: center;">Must be all correct</p> <p data-bbox="1265 1151 1477 1294" style="text-align: center;">Construct a histogram according to the above table</p>
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