KSSM · FORMS 4 AND 5 · ENGLISH

SPM 2026 DLP PRACTICE

MATHS · ADD MATHS · SCIENCE

Mathematics | Additional Mathematics | Science

Original concept questions and multipart written tasks.

Worked solutions explain steps, units and reasoning.

English-medium revision for selected Form 4 and Form 5 topics.

Selected practice, not complete official papers or a guarantee of future questions. Additional Mathematics MCQ are supplementary diagnostics.

Name: _____ Class: _____

Name: _____ Date: _____ Score: ____ / 64

Practice A — Concept Check. Original English selected-topic practice for KSSM Mathematics Forms 4 and 5. Official 1449/1: 40 MCQ, 40 marks, 90 minutes. Official 1449/2: 100 marks, 150 minutes; Section A ten questions (40), Section B five (45), Section C choose one of two (15). This module has 12 diagnostic MCQ and three extended tasks with its own practice marks, not a complete official paper. Practice total: 64 marks (12 + 18 + 16 + 18). Answer every practice question and show steps, units and checks. Required data and graph descriptions are given in the questions. Money and policy examples use fictional supplied rules; they do not state current tax law, insurance terms or financial advice. No future examination topic is guaranteed.

1. What are the roots of $x^2 - 7x + 10 = 0$?

A –2 and –5

B 2 and 5

C –2 and 5

D 1 and 10

2. Express 1011_2 in base ten.

A 7

B 9

C 13

D 11

3. Which statement is the converse of “If an integer is divisible by 4, then it is even”?

A If an integer is even, then it is divisible by 4

B If an integer is not even, then it is not divisible by 4

C If an integer is not divisible by 4, then it is not even

D Every integer divisible by 4 is divisible by 2

4. A bag contains three red and two blue counters. Two counters are selected randomly without replacement. What is the probability that both are red?

A 9/25

B 3/5

C 3/10

D 2/5

5. A simple undirected network has vertices A, B, C, D and exactly these edges: AB, AC, AD, BC, CD. What is the degree of vertex C?

A 1 **B** 2

C 3 **D** 4

6. A vehicle's speed increases uniformly from 0 to 8 m s^{-1} in 4 s, stays at 8 m s^{-1} for 6 s, then decreases uniformly to 0 in 2 s. What distance does it travel?

A 72 m **B** 96 m

C 48 m **D** 24 m

7. y varies directly as x and inversely as z. If y = 12 when x = 6 and z = 2, find y when x = 9 and z = 3.

A 6 **B** 8

C 18 **D** 12

8. Matrices are written as [[first row], [second row]]. What is the inverse of [[2, 1], [1, 1]]?

A [[2, −1], [−1, 1]] **B** [[1, −1], [−1, 2]]

C [[1, 0], [0, 1]] **D** [[−1, 1], [1, −2]]

9. A fictional policy rule deducts RM500 from an eligible RM3,500 loss, then pays 80% of the remaining amount. What does the insurer pay under this supplied rule?

A RM2,400 **B** RM2,800

C RM3,000 **D** RM600

10. Use this fictional annual tax rule only: first RM10,000 at 0%; next RM10,000 at 5%; amount above RM20,000 at 10%. With no reliefs or rebates, what is the tax on RM26,000?

A RM2,600 **B** RM1,300

C RM1,100 **D** RM600

11. For $y = 2 \sin \theta$ with θ in degrees, which pair gives its amplitude and period?

A 2 and 180° **B** 2 and 360°

C 1 and 360° **D** 4 and 360°

12. A length is recorded to the nearest whole centimetre. What are the continuous class boundaries for the recorded class 20–29 cm?

A 20 and 29 cm **B** 19 and 29 cm

C 20 and 30 cm **D** 19.5 and 29.5 cm

Practice B — Written Tasks. Answer all tasks. Show working; use extra sheets for longer answers.

1. A THREE-SIDED GARDEN

A rectangular garden is built beside a straight wall that is long enough. Exactly 40 m of fencing is used for the other three sides. Each of the two sides perpendicular to the wall has length x metres. There is no gate or overlap in the fence.

(a) Express the remaining fenced side and the area A in terms of x. State the domain giving positive side lengths. [4]

(b) The target area is 192 m². Form and solve the quadratic equation by factorisation. Give both sets of garden dimensions. [4]

(c) Before any extra width restriction, rewrite A in completed-square form and find the maximum area and its dimensions. [4]

(d) An extra condition now requires $x \leq 9$ m. Which target-area solution remains valid? Verify both the fencing length and its area. [4]

(e) State one assumption of the model and explain how it would need adjustment if a gate replaced part of the fencing. [2] [18 marks]

2. MATRICES AND TWO BASKETS

For this fictional purchase, each notebook has the same price p ringgit and each marker has the same price q ringgit. Basket A contains three notebooks and two markers and costs RM18. Basket B contains two notebooks and five markers and costs RM23. There are no discounts, taxes or extra charges. Write matrices as [[first row], [second row]]; a column vector is written $[p, q]^T$.

(a) Write the two equations and the matrix equation. Explain what each row and column of the coefficient matrix represents. [4]

(b) Calculate the determinant and inverse of the coefficient matrix. [4]

(c) Use the inverse to find p and q. Check both prices in the original basket totals. [6]

(d) Calculate the cost of four notebooks and three markers. [2] [16 marks]

Practice B — Written Tasks. Answer all tasks. Show working; use extra sheets for longer answers.

3. EXACT AND GROUPED DISPERSION

Group A's complete five daily reading times, in minutes, are 6, 8, 8, 10, 12. For quartiles, exclude the central median, then take the median of each remaining half. Divide variance by the number of supplied observations, not by n – 1.

Group B is a separate group summarised by equal-width continuous classes:

Time t / minutes | Frequency

$10 \le t < 20$ | 2

$20 \le t < 30$ | 4

$30 \le t < 40$ | 4

$40 \le t < 50$ | 2

(a) Find Group A's mean, range, Q_1, Q_3 and interquartile range. [5]

(b) Calculate Group A's variance and standard deviation. [3]

(c) Give Group B's class midpoints. Calculate Σf, Σfm and the estimated mean, where m is a midpoint. [4]

(d) Calculate Σfm^2, then Group B's estimated variance and standard deviation using $\sigma^2 = \Sigma fm^2/\Sigma f - \text{mean}^2$. [4]

(e) Explain why Group B's measures are estimates, and compare absolute spread between the groups using standard deviation. Give final standard deviations to two decimal places. [2] [18 marks]

MT — Worked Answers

Worked solutions · author-created practice rubric

Practice A — Concept Check

Mathematics	1 **B**	2 **D**	3 **A**	4 **C**	5 **C**	6 **A**
	7 **D**	8 **B**	9 **A**	10 **C**	11 **B**	12 **D**

Practice B — Written Tasks

Mathematics

1. (a) Let the third fenced side be L. Then $2x + L = 40$, so $L = 40 - 2x$ (1). Area $A = x(40 - 2x)$ (1) $= 40x - 2x^2$ m² (1). Both sides must be positive: $x > 0$ and $40 - 2x > 0$, hence $0 < x < 20$ (1).

(b) $40x - 2x^2 = 192$, so $x^2 - 20x + 96 = 0$ (1). Factorise: $(x - 8)(x - 12) = 0$ (1). $x = 8$ gives $L = 24$, so dimensions 8 m by 24 m (1). $x = 12$ gives $L = 16$, so dimensions 12 m by 16 m (1). Both satisfy the original positive-length domain.

(c) $A = -2(x^2 - 20x) = -2[(x - 10)^2 - 100]$ (1) $= 200 - 2(x - 10)^2$ (1). Since the squared term is non-negative, $A \leq 200$, with equality at $x = 10$ (1). Maximum area = 200 m², dimensions 10 m by 20 m (1). No differentiation is required; the graph is symmetric about $x = 10$.

(d) $x = 8$ is valid because $8 \leq 9$; $x = 12$ is rejected by the new restriction (1). $L = 40 - 2(8) = 24$ m (1). Fence check: $8 + 8 + 24 = 40$ m (1). Area check: $8 \times 24 = 192$ m² (1). The earlier unrestricted maximum is not being claimed for the newly restricted domain.

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