Contents

The solution page of this book

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Practice Paper Analysis

	Paper 1	Paper 2
Full Mark	80	80
Time	90 Minutes	90 Minutes
Calculator	Not allowed	Needed
Section A	6 Short Questions	
Section B	3 Structured Questions	
Topic Categories	Category 1: Algebra Category 2: Functions Category 3: Geometry Category 4: Statistics Category 5: Calculus	

Categories	Topics	Mark Ranges	Percentages
Category 1: Algebra	Standard Form	17 to 25 Marks	11% to 16%
	Arithmetic Sequences		
	Geometric Sequences		
	Binomial Theorem		
	Proofs and Identities		
Category 2: Functions	Quadratic Functions	25 to 29 Marks	16% to 18%
	Functions		
	Exp. and Log. Functions		
	Coordinate Geometry		
Category 3: Geometry	Trigonometry	32 to 36 Marks	20% to 23%
	2-D Trigonometry		
	Areas and Volumes		
Category 4: Statistics	Statistics	34 to 42 Marks	21% to 26%
	Probability		
	Discrete Distributions		
	Binomial Distribution		
	Normal Distribution		
	Bivariate Analysis		
Category 5: Calculus	Differentiation	36 to 44 Marks	23% to 28%
	Apps. of Differentiation		
	Integration		
	Apps. of Integration		

Formula List of Analysis and Approaches Standard Level for IBDP Mathematics

Analysis & Approaches Standard Level	**Analysis & Approaches Higher Level**
Applications & Interpretation Standard Level	**Applications & Interpretation Higher Level**

9 Coordinate Geometry

✓ Consider the points $P(x_1, y_1)$ and $Q(x_2, y_2)$ on a x-y plane:

1. $m = \frac{y_2 - y_1}{x_2 - x_1}$: Slope of PQ
2. $d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$: Distance between P and Q
3. $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$: The mid-point of PQ

✓ Forms of straight lines with slope m and y-intercept c:

1. $y = mx + c$: Slope-intercept form
2. $Ax + By + C = 0$: General form

✓ Ways to find the x-intercept and the y-intercept of a line:

1. Substitute $y = 0$ and make x the subject to find the x-intercept
2. Substitute $x = 0$ and make y the subject to find the y-intercept

10 Trigonometry

✓ Trigonometric identities:

1. $\tan\theta \equiv \frac{\sin\theta}{\cos\theta}$
2. $\sin^2\theta + \cos^2\theta \equiv 1$

✓ Double angle formula:

1. $\sin 2\theta = 2\sin\theta\cos\theta$
2. $\cos 2\theta = 2\cos^2\theta - 1 = 1 - 2\sin^2\theta = \cos^2\theta - \sin^2\theta$
3. $\tan 2\theta = \frac{2\tan\theta}{1 - \tan^2\theta}$

Analysis and Approaches Standard Level for IBDP Mathematics
Practice Paper Set 1 – Paper 1 (90 Minutes)

Question – Answer Book

Instructions

1. This paper consists of **TWO** sections: A and B.

2. Attempt **ALL** questions. Write your answers in the spaces provided in this Question - Answer Book.

3. No calculator is allowed.

4. You are suggested to prepare a formula booklet of Analysis and Approaches for IBDP Mathematics when attempting the questions.

5. Supplementary answer sheets and graph papers will be supplied on request.

6. Unless otherwise specified, **ALL** working must be clearly shown.

7. Unless otherwise specified, numerical answers should be either **EXACT** or correct to **3 SIGNIFICANT FIGURES**.

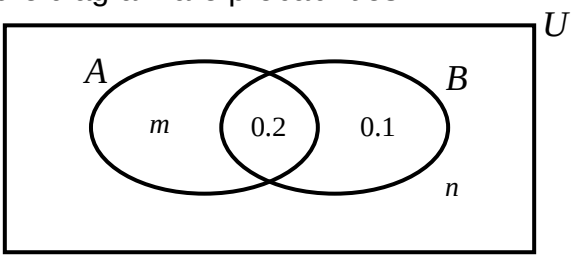
8. The diagrams in this paper are **NOT** necessarily drawn to scale.

9. Information to be read before you start the exam:

	Marker's Use Only	Examiner's Use Only	
Question Number	**Marks**	**Marks**	**Maximum Mark**
Section A			
1			**6**
2			**6**
3			**5**
4			**6**
5			**8**
6			**8**
Section A Total			**39**
Section B			
7			**15**
8			**14**
9			**12**
Section B Total			**41**
Overall			
Paper 1 Total			**80**

Section A (39 marks)

1. The following Venn diagram shows the events A and B, where $\mathrm{P}(A) = 0.6$. The values in the diagram are probabilities.



(a) Find m.

[2]

(b) Find n.

[2]

(c) Find $\mathrm{P}(B')$.

[2]

4. (a) Show that $(2n+1)^2+(2n+3)^2+(2n+5)^2=3(4n^2+12n+11)+2$, where $n\in\mathbb{Z}$.

[3]

(b) Hence, or otherwise, prove that the sum of the squares of any three consecutive odd numbers is greater than a multiple of 3 by 2.

[3]

9. The graph of f is given by $f(t) = a\sin b(t-c) + d$, $a > 0$, $t \geq 0$.

When $t = 2$, there is a maximum value of 37, at P. When $t = 11$, there is a minimum value of -5. The graph of f is strictly decreasing at $2 < t < 11$.

(a) (i) Show that $a = 21$.

(ii) Find the exact value of b.

(iii) Find the value of d.

(iv) Write down a possible value of c.

[7]

The graph of f is then transformed to the graph of g by a horizontal stretch of scale factor 3, followed by a translation of $\begin{pmatrix} 17 \\ 8 \end{pmatrix}$. Let P' be the image of P.

(b) Find the coordinates of P'.

[2]

The graph of g is then transformed to the graph of h by a translation of $\begin{pmatrix} -5 \\ 12 \end{pmatrix}$.

(c) Give a full geometric description of the transformation that maps the graph of h to the graph of f.

[3]

AA SL Practice Set 1 Paper 1 Solution

Section A

1. (a) $m+0.2=0.6$ (M1) for valid approach
$m=0.4$ A1 N2
[2]

(b) $n+0.4+0.2+0.1=1$ (A1) for substitution
$n=0.3$ A1 N2
[2]

(c) $\mathrm{P}(B')=0.4+0.3$ (M1) for valid approach
$\mathrm{P}(B')=0.7$ A1 N2
[2]

2. (a) The mean
$=\frac{300}{15}$ (M1) for valid approach
$=20$ A1 N2
[2]

(b) (i) -40 A1 N1

(ii) The new variance
$=(-2)^2(9)$ (M1) for valid approach
$=36$ A1 N2

(iii) 6 A1 N1
[4]