ATHENS COLLEGE
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ATHENS COLLEGE • PSYCHICO COLLEGE • KINDERGARTEN J. M. CARRAS
1925

Diploma Programme

INTERNATIONAL BACCALAUREATE (IB) DIPLOMA PROGRAMME (DP)

SAMPLE ADMISSIONS EXAMINATION PAPER

MATHEMATICS

IMPORTANT NOTICE

The sample questions provided below are intended to illustrate the types of exercises and questions that candidates may encounter in the examination. They can be used as examples to help candidates become familiar with the format and prepare for the overall experience of taking the actual exam.

Please note that these sample exercises are provided for guidance and practice purposes only. They do not fully reflect the number of questions, the length of the examination, or the level of difficulty of the exercises that will appear in the actual exam.

Candidates are therefore advised to use the sample questions as a general preparation tool rather than as an exact representation of the examination.

Exercise 1

Round the following numbers to the appropriate level indicated.

(a) 18392 to 2 significant figures

(b) 83.19831 to 2 decimal places

(c) π to the nearest whole number

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Exercise 2

(a) Solve the equation $\frac{2x+1}{3} - \frac{3-x}{2} = 1$.

(b) Solve the equation $-x^2 + 4x - 3 = 0$.

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Exercise 3

(a) Solve the inequality $(2x-1)(x+1)>0$.

(b) Solve the inequality $\dfrac{2x-1}{x+1}>0$.

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Exercise 4

Fully factorize the following:

(a) $16a^2b^3 - 8a^2b + 4ab^2 - 2ab$.

(b) $a^2 - 4a + 4$.

(c) $a^4 - b^4$.

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Exercise 5

Consider the equation $kx^2-(k-3)x+k-8=0$

(a) Find the values of k, for which, the equation has no real roots.

(b) Hence find the values of k, for which

$kx^2-(k-3)x+k-8>0$ for all $x\in\mathbb{R}$.

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Exercise 6

(a) Find the value of x if 35% of 200 is x.

(b) Find the value of x if $x\%$ of 400 is 80.

(c) Find the value of x if 80% of x is 60.

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Exercise 7

(a) Find the value of x if $2^x = 16$.

(b) Find the value of x if $2^x = \frac{1}{8}$.

(c) Find the value of x if $10^x = 0.000001$.

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Exercise 8

(a) Find the possible values of x if $x^2 = 16$.

(b) Find the possible values of x if $x^2 = 5$.

(c) Find the value of x if $x^3 = 8$.

(d) Find the value of x if $x^3 = 5$.

(e) Find the value of x if $\sqrt{x} = 5$.

(f) Find the value of x if $\sqrt[3]{x} = 2$.

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Exercise 9

Find the values of x and y that satisfy the system of equations:

$$\begin{cases} 2x - 3y = 11 \\ 3x + y = 11 \end{cases}$$

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Exercise 10

Find the specified terms in each of the following sequences.

(a) The 10^{th} term in the sequence $2,\ 4,\ 6,\ldots$.

(b) The 6^{th} term in the sequence $1,\ 2,\ 4,\ldots$.

(c) The 10^{th} term in the sequence $1,\ 4,\ 9,\ 16,\ldots$.

(d) The 6^{th} term in the sequence $1,\ 1,\ 2,\ 3,\ 5,\ldots$.

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Exercise 11

Consider the function $f(x) = 5 - 3x.$

(a) Find the value of $f(-2).$

(b) Find the value of x if $f(x) = 1$.

(c) Find the value of h if the graph of $f(x)$ goes through $(1, h).$

(d) Find the value of k if the graph of $f(x)$ goes through $(k, 3).$

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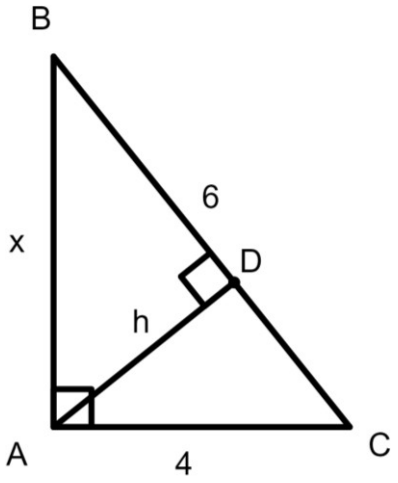
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Exercise 12

Consider the following right triangle ABC, with AB $= x$, $AC = 4$, $BC = 6$ and $AD = h$, the height of the triangle inside BC.



(a) Find the value of x.

(b) Hence, find the area of triangle ABC.

(c) Hence, find the value of h.

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