ATHENS COLLEGE
Hellenic-American Educational Foundation
Kindergarten • Elementary • Junior High • High
ATHENS COLLEGE • PSYCHICO COLLEGE • KINDERGARTEN J. M. CARRAS
1925

International Baccalaureate Diploma Programme
SAMPLE ADMISSIONS EXAMINATION PAPER
MATHEMATICS

IMPORTANT NOTICE: The sample questions below illustrate the **type of exercises** that will feature in the exam and as such you can use them as examples to get you ready for the overall experience of taking the actual exam. **These exercises do not fully represent the number of questions and the level of difficulty of the actual exercises that will be on the exam.**

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 $2|x+1|-6=0$.

(c) 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 $\dfrac{2x-1}{x+1}>0$.

(c) Hence solve the inequality $\dfrac{2|x|-1}{|x|+1}>0$.

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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 $x\in\square$.

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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 10th term in the sequence $2,\ 4,\ 6,\ldots$.

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

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

(d) The 6th 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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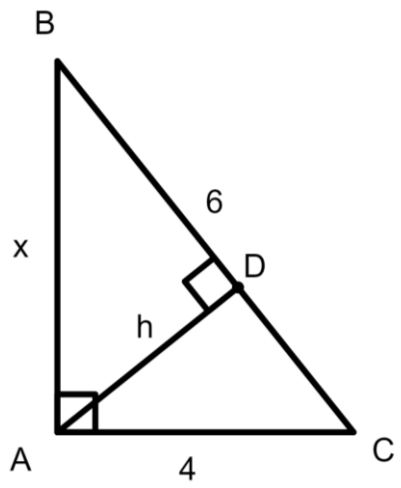
Exercise 12

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