It is expected that all students have extensive previous mathematical experiences and that they are familiar with the following topics before they enter the IB Diploma Programme.
Therefore the following table lists the topics covered by the entrance exam in Mathematics.

Topic	Content
Number	**Approximations and standard form** Students must be able to: - Round to a given order of magnitude; eg the nearest thousand - Round to a set number of decimal places - Round to a set number of significant figures - Write number in a standard form (scientific notation)
Algebra	**Algebra of expressions** Students must be able to: - Manipulate with algebraic expressions (including simplifying algebraic expressions with indices and surds) **Theory of functions** Students are expected to be familiar with: - Concept of a function - Domain and range of a function - Inverse function - Composite function **Simultaneous equations (where functions meet)** Students are expected to be familiar with: - Different methods of solving different types (e.g. two linear, one linear one quadratic, etc) of simultaneous equations **Straight line graphs** Students are expected to be familiar with: - Linear functions, their graphs, and properties (increase/decrease, sign) **Quadratics** - Different methods of solving quadratic equation - Quadratic function (factorised, completed square, and general form)

	- Vieta's formulas
	- Quadratic inequalities
	Exponentials
	    - Exponential function
	    - Exponential equations
	    - Exponential inequalities
	Logarithms
	    - Laws of logarithms
	    - Logarithmic function
	    - Logarithmic equations
	    - Logarithmic inequalities	

Coordinate geometry	Students are expected to know how to find: - Distance between two points - Mid-point of line segment - Slope/Gradient of a line - Equation of a line (parallel and pependicular lines) - Perpendicular bisector - Distance from a point to a line	
Trigonometry	Students are expected to be familiar with: - Trigonometric ratios - Trigonometric identities - Unit circle and radian measure	

Examples of questions for the entrance exam:

1. Find the equation of a line (in *gradient – intercept form* $y = kx + n$) which is parallel to a line with equation $x - 3y + 4 = 0$ and passes through the point A(1,5). Hence, graph the line and determine its sign, and increase/decrease.

2. Find the equation of the quadratic in the form $y = ax^2 + bx + c$ with graph given below:
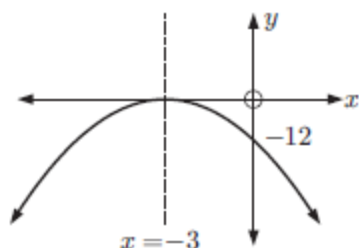
3. Solve exponential inequality: $2^{x+1} + 7 \cdot 2^{-x} > 9$

4. Solve logarithmic equation: $\log_x 10 + 2\log_{10x} 10 + 3\log_{100x} 10 = 0$

5. Find the exact value of $\sin\theta$, $\tan\theta$ and $\cot\theta$ if $\cos\theta = -\dfrac{3}{4}$ and $\dfrac{\pi}{2} < \theta < \pi$.

6. Simplify: $\left(\dfrac{1}{b-\sqrt{a}} + \dfrac{1}{b+\sqrt{a}}\right) : \dfrac{a^{-2} \cdot b^{-1} \cdot \sqrt[-2]{\dfrac{1}{9}}}{a^{-2} - a^{-1} \cdot b^{-2}}$.

7. Evaluate: $5\tan 540° + 2\cos(-1170°) - \sin(-900°) - 3\cos 810°$.

8. In the equation $x^2 - 2mx + 2 = 0$ determine the value of parameter m so that the roots of equation satisfy $(3x_1 - 1)(3x_2 - 1) = 10$.

9. Which point on the x-axis is equidistant from points A(7, - 4), B(1, - 2).

10. Solve the inequality: $2x^2 + x - 45 < 0$.

11. Solve simultaneous equations: $\begin{cases} x + 5y + 2 = 0 \\ 5xy + 8 = 0 \end{cases}$

12. Find the inverse function of $f(x) = \log_2(x-1) + 1$ and explain how to verify your answer.

13. Suppose $f : x \mapsto x^2$ and $g : x \mapsto 2 - x$. Find the value(s) of x such that $(g \circ f)(x) = f(x)$

14. Calculate: $\left(\dfrac{1}{3}\right)^{\log_{\sqrt{3}} 5 - \log_9 25}$.

15. Solve the inequality: $2^{\log_8(x-1)} > x - 1$.