

## Entrance Exam to IB Diploma Program

Subject: **Mathematics**

Duration: 90 min

Date: 22<sup>nd</sup> June, 2022

Name: \_\_\_\_\_

1. State domain and simplify the fraction:  $\frac{(3a-b)^2+12ab}{9a^2-b^2}$ . [5]
2. If  $f(x) = \frac{2x+1}{x-2}$ , find  $(f \circ f)(x)$ . [5]
3. Solve the inequality:  $\left(\frac{1}{4}\right)^{x^2} < 16 \cdot 2^{5x-7}$ . [5]
4. Determine parameters  $a$  and  $b$  so that function  $y = ax + b$  passes through the points  $M(3, 3)$  and  $N(7,5)$ . Hence, sketch the graph of a function by showing all important features. [5]

Good luck!