Entrance Exam to IB Diploma Program

Subject: **Mathematics**
Duration: 90 min

Date: 15$^{\text{th}}$ June, 2020

Name:_____

1. Simplify the expression: $\dfrac{2a}{a^2-4x^2}+\dfrac{1}{2x^2+6x-ax-3a}\cdot\left(x+\dfrac{3x-6}{x-2}\right).$ [5]

2. Find the equation of quadratic function in the general form whose graph has x-intercept 4, the minimum value of -9 and the y-intercept -8.   [5]

3. Solve the inequality: $2^{x+1}+7\cdot2^{-x}>9$.   [5]

4. Find the value of the expression: $5\tan540^\circ+2\cos\left(-1170^\circ\right)-\sin\left(-900^\circ\right)-3\cos810^\circ$.   [5]

Good luck!