Exercise 1 [4 points]

Let \( f(x) = \begin{cases} \ ax + 2b & ; \ x \leq 0 \\ x^2 + 3a - b & ; \ 0 < x \leq 2 \\ 3x - 5 & ; \ x > 2 \end{cases} \)

For which values of \( a \) and \( b \), the function \( f \) is continuous at 0 and 2?

Exercise 2 [3 points]

A particle is moving along the hyperbola \( xy = 16 \). As it reaches the point \((8, 2)\), the \( y \)-coordinate is decreasing at a rate of 3 cm/s. How fast is the \( x \)-coordinate of the point changing at that instant?

Exercise 3 [3 points]

Let \( y = mx + b \) be the equation of a line parallel to the line \( y = (\ln 2)x \) and tangent to the graph of \( y = 2^{x+3} \). Find \( m \) and \( b \).