16F E4
Suppose that \( f(z) \) is a rational function (not a polynomial) from the complex numbers to the complex numbers. If \( f(z) = \frac{h(z)}{k(z)} \) where \( h(z) \) and \( k(z) \) are polynomials in \( \mathbb{C}[z] \) can you say whether or not \( f(z) \) is defined for all \( z \in \mathbb{C} \)? Does this change if degree \( h > 0 \)? What if degree \( k > 0 \)?

18A E1, E3, E4, E5, E6, E7
We will collect 18AE3, 18AE7, and the following problem (suggested in class):
Prove that the Fundamental Theorem of Algebra is equivalent to the following Theorem.
Theorem: Any \( f(z) \in \mathbb{C}[z] \), degree \( f > 0 \), is a product of linear polynomials in \( \mathbb{C}[z] \).