1. Find the limit as \( x \) goes to 0 of the following function if it exists or show why it does not exist: \( \frac{x^2 - 81}{2x - 18} \)

**Solution:** We rewrite the \( \frac{x^2 - 81}{2x - 18} \) as \( (1/2)\left(\frac{(x-9)(x+9)}{(x-9)}\right) \) We see that the \( (x - 9) \) terms in the numerator and denominator cancel. Leaving us with \( 1/2(x + 9) \) and we see that the limit as \( x \) goes to 0 of this function is 9/2.