1. Evaluate $\lim_{x\to 1} x$.

2. Why can't we evaluate
$$\lim_{x\to 1} \frac{x^2 - x}{x - 1}$$
by direct substitution? What do we get?

3. We want to try to compute this limit anyway. Factor the numerator. Since we are **not** looking at the value at $x = 1$, we can cancel a factor. What do we get now?

4. Define
$$f(x) = \begin{cases} \frac{x^2-x}{x-1} & x \neq 1 \\ a & x = 1 \end{cases}$$
What value should be assigned to a in to make f a continuous function on $\mathbb{R}$?

5. Use the same factoring procedure to try to evaluate the following limits. Note that direct substitution always gives the same 'answer' initially.
$$\lim_{x\to 2} \frac{x^2 - 4}{(x-2)^3} \qquad \lim_{x\to 3} \frac{(x-3)^2}{x^2 - 9} \qquad \lim_{x\to -2} \frac{x^2 + 3x + 2}{x^2 + 4x + 4}$$

6. What does that say about problems where that same answer shows up by direct substitution?