Quiz 7 solutions

By using the puncture law and factoring correctly, compute the following limit:

$$\lim_{x \to -2} \frac{x^2 - 4}{x^2 + x - 2}.$$

$$\begin{aligned}
\lim_{x \to -2} \frac{x^2 - 4}{x^2 + x - 2} &= \lim_{x \to -2} \frac{(x+2)(x-2)}{(x+2)(x-1)} \\
&= \lim_{x \to -2} \frac{(x-2)}{(x-1)} \\
&= \frac{\lim_{x \to -2}(x-2)}{\lim_{x \to -2}(x-1)} \\
&= \frac{-2-2}{-2-1} \\
&= \frac{-4}{-3} \\
&= \frac{4}{3}.
\end{aligned}$$

Note we used the puncture law in the second line (when we "cancelled" the $x + 2$ factors).