Let $S$ be the language of all binary strings that have odd length with a 1 in the middle (such as $10110$).

Use the Pumping Lemma to show that $S$ is not regular.

Suppose the language $S$ is regular.
Let $k$ be the constant of the Pumping Lemma.
Let string $z = 0^k10^k$.
Note that $z$ is in $S$ and $|z| \geq k$.
Split $z = uvw$ according to the Pumping Lemma, with $|uv| \leq k$.
Then $v$ is contained within the first block of 0s. So the first pump up, $uw^2w$, is no longer in $S$.
This is a contradiction of the Pumping Lemma.