Prove by induction that, for all positive integers n,

$$\sum_{r=1}^{n} 3^{r-1} = \frac{1}{2}\left(3^n - 1\right).$$

5

Answer:

Proof. Establish base case when $n = 1$, assume true for $n = k$, prove true for $n = k + 1$ and communicate result correctly. See marking instructions for details.