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9. Find an explicit formula for the sequence whose first few terms are $a_1 = \frac{1}{2}$, $a_2 = -\frac{2}{3}$, $a_3 = \frac{3}{4}$, $a_4 = -\frac{4}{5}$, $a_5 = \frac{5}{6}$, $a_6 = -\frac{6}{7}$.

$$a_k = (-1)^{k+1} \frac{k}{k+1}$$

10. True or False. If true, **prove** it. If false, then give a **counterexample**. If n is an integer with $n \bmod 3 = 1$, then $\lfloor n/3 \rfloor = (n-1)/3$.

True we start with $n = 3k+1$ for some integer k.

We compute $\left\lfloor \frac{n}{3} \right\rfloor = \left\lfloor \frac{3k+1}{3} \right\rfloor = \left\lfloor k + \frac{1}{3} \right\rfloor = k$

On the otherhand $\frac{n-1}{3} = \frac{3k+1-1}{3} = \frac{3k}{3} = k$.

Thus $\left\lfloor \frac{n}{3} \right\rfloor = \frac{n-1}{3}$ as claimed.