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MATH 5320 Quiz 4

1. Prove $1 + r^1 + r^2 + \cdots + r^n = \frac{1-r^{n+1}}{1-r}$ using induction and compute $1 + (\frac{1}{2})^1 + (\frac{1}{2})^2 + (\frac{1}{2})^3 + \cdots + (\frac{1}{2})^{100}$ and compute $1 + (\frac{1}{2})^1 + (\frac{1}{2})^2 + (\frac{1}{2})^3 + \cdots$.
2. Use the preceding to prove the following. You must define the partial sums and show they converge.
Proposition: Let $\sum_{n=0}^{\infty} r^n$ be an infinite series. If $|r| < 1$ then the series $\sum_{n=0}^{\infty} r^n$ converges to $\frac{1}{1-r}$.
3. Section 2.5: 1,2a,3,4,5
4. Section 2.6: 1, 2,3, 11a