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**Quiz – October 22, 2004**

Does the series  $\sum_{k=1}^{\infty} \frac{4^{k+1}}{7^{k-1}}$  converge or diverge? If the series converges, find its sum.

**Answer:** The series is the geometric series

$$\frac{4^2}{1} + \frac{4^3}{7} + \frac{4^4}{7^2} + \dots$$

This series has initial term  $a = 16$  and ratio  $r = \frac{4}{7}$ . We see that  $-1 < r < 1$ .

We conclude that the series converges to the sum  $\frac{a}{1-r} = \boxed{\frac{16}{1 - \frac{4}{7}}}$ .