Do the following series converge or diverge?

If a series converges, find the value to which it converges
If you cannot find the exact value, approximate it by computing S_{100}

1. $\displaystyle\sum_{k=0}^{\infty} \frac{-3}{5^k}$

2. $\displaystyle\sum_{k=1}^{\infty} \frac{3k^2 + 1}{2k^2 + k + 2}$

3. $\displaystyle\sum_{k=13}^{\infty} \frac{1}{2^k}$

4. $\displaystyle\sum_{k=2}^{\infty} \frac{1}{4^k + 7}$

5. $\displaystyle\sum_{k=42}^{\infty} \frac{7^k}{5^k - k}$

For the series $\displaystyle\sum_{k=1}^{\infty} \frac{1}{n^2}$, the WolframAlpha syntax to calculate S_{30}, the 30th partial sum, is

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sum 1/n^2 from n=1 to n=30
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