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2015 11 d Find the limiting sum of the geometric series $1 - \frac{1}{4} + \frac{1}{16} - \frac{1}{64} + \dots$

2

$$a = 1, r = -\frac{1}{4}$$

$$\begin{aligned} S_{\infty} &= \frac{a}{1-r} \\ &= \frac{1}{1 + \frac{1}{4}} \\ &= 1 \div \frac{5}{4} \\ &= \frac{4}{5} \end{aligned}$$

State Mean:
1.62

* These solutions have been provided by [projectmaths](#) and are not supplied or endorsed by BOSTES.

Board of Studies: Notes from the Marking Centre

(d) This part was done well. In better responses, candidates showed how they calculated the value of r by using $\frac{T_2}{T_1}$ and then substituted into the formula for the limiting sum of a geometric series.

Common problems were:

- using the absolute value of r
- using an incorrect formula.