

Limits Task

In a mathematics test students were given the problem:

“If $\lim_{x \rightarrow 1} (4f(x) + 2 - 4x) = -10$ what can you deduce about the $\lim_{x \rightarrow 1} (f(x))$?”

- What do you think the examiner intended by setting this problem?
- A student responded as follows:

“Suppose that $\lim_{x \rightarrow 1} (f(x)) = \alpha$.

Then according to the assumptions of the problem and the properties of limits, we have:

$$-10 = \lim_{x \rightarrow 1} (4f(x) + 2 - 4x) = 4 \lim_{x \rightarrow 1} (f(x)) + 2 - 4 \lim_{x \rightarrow 1} x = 4\alpha + 2 - 4 = 4\alpha - 2.$$

Then $\alpha = -2$ ”

What comments would you make to this student with regard to this response?

Publications with reference to the *Limits Task*

Biza, I., Nardi, E., & Zachariades, T. (2014). Using situation-specific tasks to explore teacher mathematical knowledge and pedagogical beliefs: Examples from algebra and analysis [Translated into Portuguese]. In T. Rogue & V. Giraldo (Eds.), *O saber do professor de matemática: ultrapassando a dicotomia entre didática e conteúdo [Mathematics teachers' knowledge: beyond the dichotomy between pedagogy and content]* (pp. 221-255).

Zachariades, T., Biza, I., & Nardi, E. (2007). Using tasks to explore teacher knowledge in situation-specific contexts: An example from the limits teaching]. In H. Sakonides & D. Desli (Eds.), *Proceedings of the 2nd Conference of the Greek Association for Research in Mathematics Education (GARME)* (pp. 536-546). Alexandroupolis, Greece.

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Let us know whether this task is useful at @mathtask or email Irene Biza at i.biza@uea.ac.uk. For more tasks, visit MathTASK.