

## Appendix: Sources consulted in designing the Basel worksheet

For an overview of the modern history of the Basel problem, and the list of modern solutions, I directly referenced Campbell & Levrie (2026).

Key in understanding Euler's language was the explanation provided by McKinzie & Tuckey (1997).

Dunham (1987) highlights the modernity of the proof by induction of  $\sum_{k=1}^{\infty} \frac{1}{k^2+k} = 1$ , which I added as an extension; Dunham explains in detail the original proof by Bernoulli, which I only briefly mentioned in the lesson as "cumbersome."

I found an interesting historical digression on the correspondence between Euler and Goldbach about the upper bounds for the Basel Problem, which I then mentioned in a footnote in the worksheet, in (Ayoub, 1974, p. 1072-1073).

At the end of the worksheet extension, I recommend students to watch 3Blue1Brown's video (2018) presenting a purely geometric proof of the Basel Problem, which was recently proposed in a manuscript by Wästlund (2010). I was first pointed towards this resource by Jeremy Judge, my teacher mentor.

### Bibliography

- 3Blue1Brown. (2018, March 2). *Why is pi here? And why is it squared? A geometric answer to the Basel problem*. YouTube. <https://www.youtube.com/watch?v=d-o3eB9sfls>
- Ayoub, R. (1974). Euler and the Zeta Function. *The American Mathematical Monthly*, 81(10), 1067–1086. <https://doi.org/10.1080/00029890.1974.11993738>
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- Dunham, W. (1987). The Bernoullis and the Harmonic Series. *The College Mathematics Journal*, 18(1), 18–23. <https://doi.org/10.1080/07468342.1987.11973001>
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- Wästlund, J. (2010). *Summing inverse squares by euclidean geometry*. <https://www.math.chalmers.se/~wastlund/Cosmic.pdf>