About retractions of (almost) the cube onto its edges

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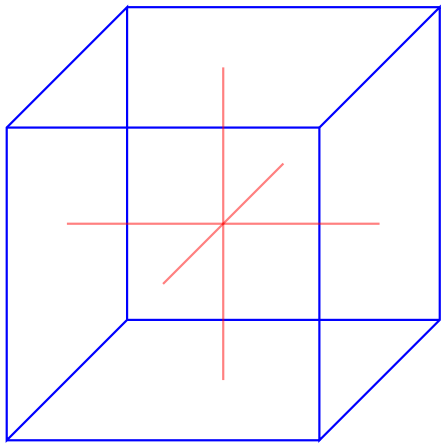
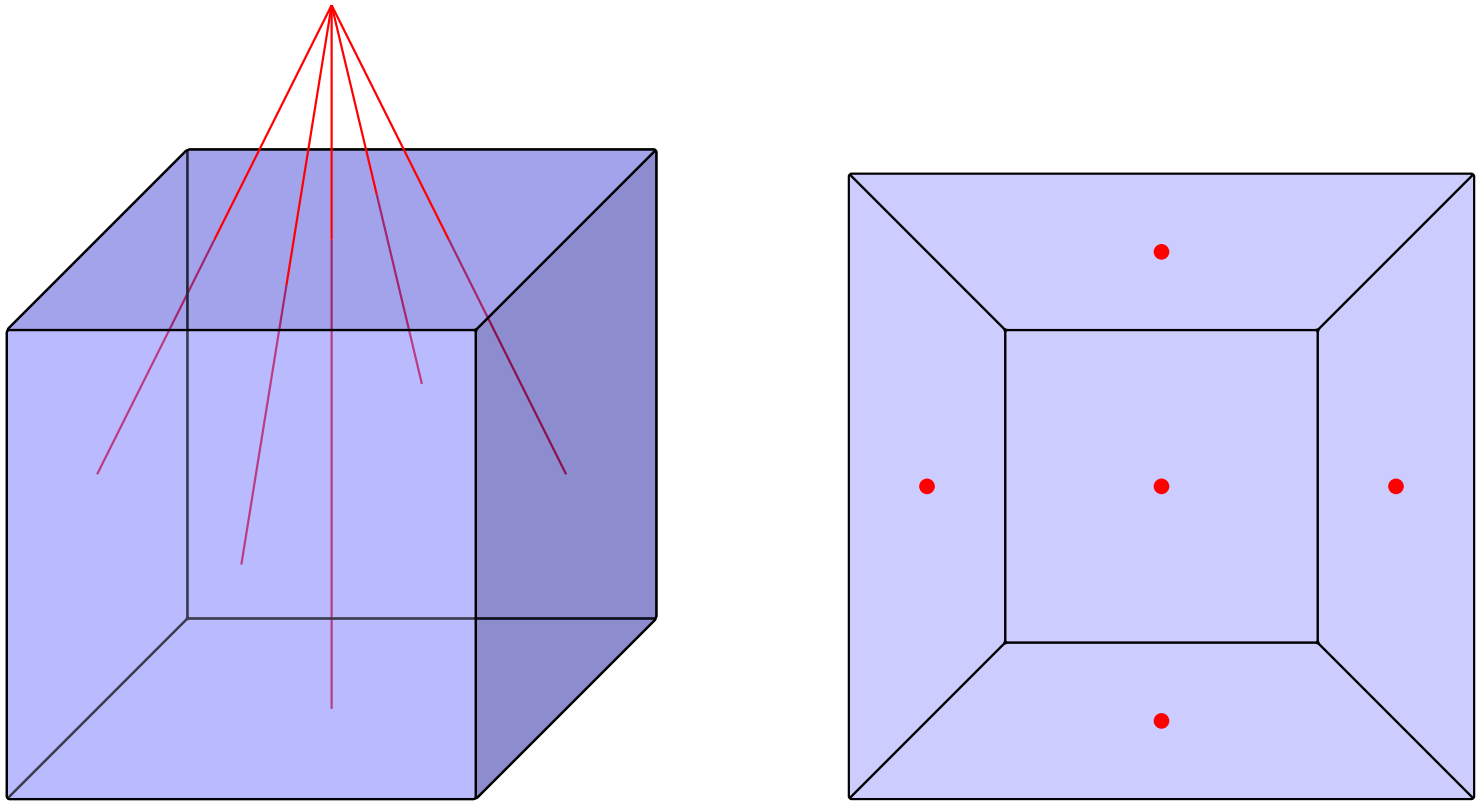
A classical retraction of (almost) the cube onto its edges

Well-known fact: the 1-skeleton of the cube Q^3 is the retraction of Q^3 minus its 1-dual skeleton.



Is it possible to obtain the 1-skeleton as the retraction of Q^3 minus a singular set *without crossings*?

A modified retraction technique



Now, the singular set is made of only *one* submanifold of $\mathbb{R}^3$.