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**MR1702378 (2000f:57003)****[Maehara, Hiroshi](#) (J-RYK); [Oshiro, Ai](#) (J-RYK)****On knotted necklaces of pearls. (English summary)***European J. Combin.* **20** (1999), *no. 5*, 411–420.[57M15](#) ([05C10](#) [57M25](#))[Journal](#)[Article](#)[Doc  
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A necklace of  $n$  pearls is a cyclic arrangement of  $n$  equal balls (pearls) in space such that any two consecutive pearls are tangent to each other. The string of a necklace is the closed polygonal curve consisting of the line-segments each connecting the centers of a pair of consecutive pearls in a necklace. A necklace is said to form a knot if its string forms a knot. A necklace is knotted if its string forms a nontrivial knot.

How many pearls are necessary to make a knotted necklace, say a trefoil knot? It is shown that 15 pearls are sufficient, and that to make a knotted necklace which can be put in the shallowest-possible showcase (a box with a glass lid), 16 pearls are necessary and sufficient.

The proofs involve nice elementary-geometric reasoning.

**Reviewed** by [Darko Veljan](#)

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