

Home-work exercises for week 7

Introduction to Contact Topology, Fall 2014

Exercise 1. Fill in all the details of the proof of Proposition 3.5.19

Exercise 2. Consider the following embedded curve in $(\mathbb{R}^3, \xi_{\text{st}})$:

$$\gamma(\theta) = \left(r \cos(\theta), r \sin(2\theta), \frac{2}{3}r^2 \sin(\theta) \cos(2\theta) - \frac{4}{3}r^2 \cos(\theta) \sin(2\theta) \right),$$

where r is a positive real number.

1. Show that γ is a Legendrian curve and compute its Thurston-Bennequin invariant, using the definition.
2. Visualize the front projection γ_F .
3. Verify your answer to the first part of this exercise by computing the Thurston-Bennequin invariant of γ from its front projection.

Exercise 3. Show that the following two knots are Legendrian isotopic:

