

EXERCISES

Math 1110 - Instructor: Itamar Oliveira

NAME: _____
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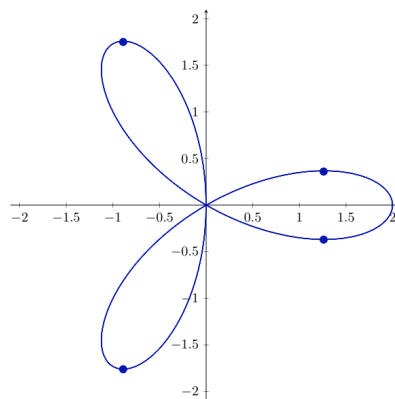
1. Compute the slope of the tangent line of the lemniscate $x^4 + 2x^2y^2 + y^4 = 16(x^2 - y^2)$ at the point $(\sqrt{6}, \sqrt{2})$.

2. A *three-petaled rose*, given by the equation

$$(x^2 + y^2)^2 = 2x^3 - 6xy^2$$

is graphed below.

- (a) If you decompose the three-petaled rose into graphs of functions, how many functions would you need?



(b) Find the equation for the line tangent to the three-petaled rose at the point $(-1, 1)$.

3. Show that the length of the portion of any tangent line to the astroid $x^{2/3} + y^{2/3} = a^{2/3}$ cut off by the coordinate axes is constant.

