

# Math 2250 HW #8

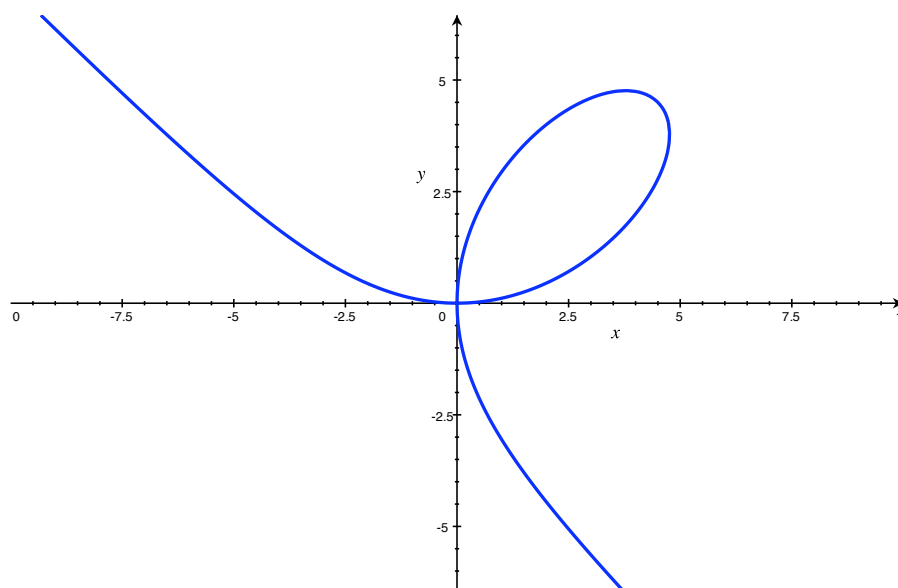
Due 1:25 PM Friday, October 7

**Reading:** Hass §3.9–3.11

**Problems:** Do the assignment “HW8” on WebWork. In addition, write up solutions to the following two problems and hand in your solutions in class on Friday.

1. The folium of Descartes, pictured below, is determined by the equation

$$x^3 + y^3 - 9xy = 0.$$



- (a) Determine the slopes of the tangent lines to the folium at the points  $(4, 2)$  and  $(2, 4)$ .
  - (b) At what point other than the origin does the folium have a horizontal tangent line?
  - (c) At what point other than the origin does the folium have a vertical tangent line?
2. Let  $f(x) = x^{\cos x}$ . What is  $f'(x)$ ?
3. The length  $\ell$  of a rectangle is decreasing at a rate of 5 cm/sec while the width  $w$  is increasing at a rate of 3 cm/sec. At the moment when  $\ell = 11$  cm and  $w = 9$  cm, determine the following rates of change:
- (a) The rate of change of the area (in  $\text{cm}^2/\text{sec}$ ).
  - (b) The rate of change of the perimeter (in  $\text{cm}/\text{sec}$ ).
  - (c) The rate of change of the diagonals (in  $\text{cm}/\text{sec}$ ).