Math 233 Warm Up Problems
September 8, 2009

1. Quiz
   (a) What is meant by “position vector?”
   (b) How can you tell the difference between a point and a vector?
   (c) Can you take the dot product of two points?
   (d) What do the following mean?
      \[
      \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}, \quad \begin{pmatrix} 1 \\ 2 \\ 3 \end{pmatrix}, \quad (1, 2, 3), \quad <1, 2, 3>
      \]
   (e) Which of the following make sense and which do not?
      \[
      (A \cdot B) \times C, \quad A \cdot (B \times C)
      \]

2. Find a parametric equation for a circle centered at \((-11, 27)\) and with radius 93.

3. Find a parametric equation for the ellipse
   \[
   30(x - 5)^2 + 16(y + 19)^2 = 36
   \]

Lecture Problems

4. Set up integrals for the lengths of the curves
   (a) Length of \(r(t) = (t, t^2, t^3)\) from \(t = 1\) to \(t = 7\).
   (b) Length of \(r(t) = (e^t, e^{-t}, \ln t)\) from \(t = 2\) to \(t = 13\).
   (c) Length of \(r(t) = (\cos t, \sin t, t, t^2)\) from \(t = 0\) to \(t = \pi\).