

Homework and Quiz 1

Due Wednesday, June 24, 2009

Ungraded homework

For practice at home, might I recommend:

Section 11.1, page 662, problems 5, 7, 19, 23, 25, 27, 37.

Section 11.2, page 672, problems 3, 5, 15, 19, 29, 41.

The answers to odd homework problems are given in the back of your textbook.

Graded Quiz

(a) Sketch the curve

$$\begin{aligned}x(t) &= (\sin t) \cdot (\cos t) \\ y(t) &= \cos t\end{aligned}$$

for $t \in [0, 2\pi]$.

(b) Sketch the curve

$$\begin{aligned}x(t) &= \sin(5t) \\ y(t) &= \cos(3t)\end{aligned}$$

for $t \in [0, 2\pi]$. What sort of phenomena do you see when you use different numbers in place of 5 and 3?

(c) Consider the curve $y(t) = \log t$, $x(t) = \sqrt{t}$ for $t \geq 1$. By reparameterizing, find a function $f : [1, \infty) \rightarrow \mathbb{R}$ whose graph is the given curve.

(d) Consider the curve described by

$$\begin{aligned}x(t) &= t^2 \\ y(t) &= t^3 + t.\end{aligned}$$

What is the slope of the tangent line to the curve through the point $(x(t), y(t))$?

(e) Write down an integral whose value is the circumference of the ellipse traced out by the points $(2 \cos t, \sin t)$ as t varies between 0 and 2π . Can you evaluate the integral?