

Homework and Quiz 4

Due Wednesday, July 1, 2009

Ungraded homework

For practice, I urge you to try:

Section 13.5, page 838, problems 13, 19, 27, 29, 33, 43, 65.

Section 14.1, page 858, problems 5, 19, 21, 44 (even, but fun!).

Section 14.2, page 864, problems 9, 11, 19, 23, 45, 51.

Of these, the most important skill is knowing how to differentiate vector-valued functions.

Graded Quiz

- (a) Let L be the line which goes through the points $(1, 2, 3)$ and $(4, 5, 6)$. Give a vector equation for the line which goes through the point $(4, 3, 2)$ and is parallel to L .

- (b) Write down an equation of the form

$$ax + by + cz = d$$

for the plane through the points $(1, 1, 1)$, $(2, 3, 4)$ and $(0, 0, 1)$.

- (c) Let θ be the angle between the planes given by

$$x + y + 2z = 1$$

$$2x + y + z = 1.$$

Find $\cos \theta$.

- (d) Consider the function $f : \mathbb{R} \rightarrow \mathbb{R}^3$ given by

$$f(t) = (t, t^2, t^3).$$

Find the unit tangent vector to the graph of f at the point $f(t)$.

- (e) Let $g : \mathbb{R} \rightarrow \mathbb{R}^2$ be the function

$$g(t) = (\cos t, 2 \sin t).$$

Find $g''(t)$.

- (f) Consider the functions

$$a(t) = (t, 1 - t, 3 + t^2),$$

$$b(t) = (3 - t, t - 2, t^2),$$

Do the graphs of a and b intersect? If so, find the angle at which they intersect.