Teaching Assitant

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Office hours:

Wednesday / Friday 11:45 AM - 12:45 PM
McHenry Library Cafe

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Reflection

Take a moment to think about what was covered last class and what is due on upcomming assignments. Which concepts, techniques, etc. feel clear and doable? Which, if any, could use more explanation or practice?

Warm Up

Discuss the following with your groups

Give plain language definitions for the following terms:

- Derivative of a Vector-Valued Function
- Integral of a Vector-Valued Function
- Limit of a Multivariable Function
- Partial Derivative.
- Projectile Motion.

Problems 1, 2 and 3

Problem 1 (9.7.5)

Given $r(t) = \cos(-2t)\hat{i} + \sin(-2t)\hat{j} - 10t\hat{k}$, find $r'(t)$ and $\int r(t)\,dt$.

Problem 2 (9.7.7)

Suppose $\vec{r}(t) = \cos(\pi t)\hat{i} + \sin(\pi t)\hat{j} + 4t\hat{k}$ is the position of a particle in a helix with height in the z direction.

(a) What is t when the particle has height 12?

(b) What is the velocity of the particle when its height is 12?

(c) When the particle has height 12, it leaves the helix and continues linearily along the tangent line at constant velocity. Find a vector parametric equation for the position of the particle in terms of t.

Problem 3 (9.7.11)

A gun has a muzzle velocity of 100 meters per second. Neglecting air resistance and setting $g = 9.8\,\text{m/sec}^2$, what angle of elevation should be used to hit a target 200 meters away?

Problems 4, 5, and 6

Problem 4 (10.2.2)

Given $f(x,y) = \sin(x-y)$, find $f_x(0,0)$ and $f_y(0,0)$.

Problem 5 (10.2.3)

If $w = \sqrt{6r^2 + 6s^2 + 5t^2}$, find $\frac{\partial w}{\partial r}$, $\frac{\partial w}{\partial s}$, and $\frac{\partial w}{\partial t}$.

Problem 6 (10.2.7)

Find the partial derivatives of the function $f(x,y) = \int_y^x \cos(-8t^2 - 5t - 6)\, dt$.

Attendance