

Differential Equations: Calculus AB

Lesson Plan 11: Linear approximation at a point + Unit-Project.

Overview

This is the final week on this unit, where we will cover small details that were left-over, and also finish the unit-project.

Learning Objectives

- Small detail to close: Tangent line to a curve at a point and local linear approximation.

The students already saw Euler's method, so this is a simple subset of that. However, Euler is by no means a pre-requisite. On the contrary: This is a different point of view, that might make the Euler method more approachable to some.

Prior Knowledge needed

- Linear line equation.

Special Materials

- Transparencies + Sharpies for students to draw their group work.

Administration

- Do we want to have unit-presentations on transparencies on Tue/Wed, or otherwise submit those as paper-transparencies on Wednesday, and work on review the next two days?
- Handout review Worksheet at the right time.
- Ask students to prepare cheat-sheet for the test for Wednesday, and we'll see if they need it.
- Grade weighting for this unit: 15+15 on Homework ; 10 on unit-project ; 60 on final test.

Instruction and activity

1. **Warm-up problem, and an opportunity to close a little hole we left:**

Given $\frac{dy}{dx} = 2x$

- a. Find particular solution such that $y(1) = 3$
- b. Find tangent line through solution point (1,3)
- c. Find the value of y on that line when $x = 1.1$.

In solving this, we can note the nature of 'approximation' in this new value, and indicate that steps (b) and (c) can be done WITHOUT step (a).

2. **Work on Unit Project.**

3. **Wrap-up** : As we go into the review phase: Which was the hardest subject for you in the unit (see list from the Review-Worksheet) ? Why? Which was the easiest?

4. **Homework**: Questions from the review sheet.

====End====