

Math 8001: Groupwork

Any current issues in your own teaching?

Your assignment

Pick a section covered in your class next week (modulo special circumstances). Develop two groupworks: one which focuses on computations, and one which is more conceptual.

(I'll post our UMTYMP groupwork template if you'd like to use \LaTeX .)

Why Groupwork?

Not everybody shares the view that lectures have been effective for thousands of years.

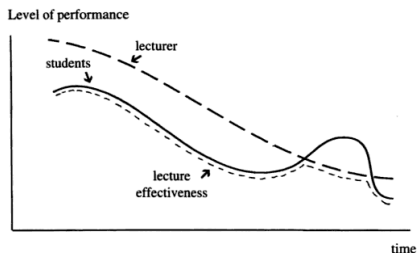


Figure 5.4. Level of performance during a lecture (after Lloyd, 1968)

Bligh, *What's the Use of Lectures?*, 1998

Others suggest that students take notes on / assimilate just 20-40% of a lecture. (Kiewra, 2002.)

Definitions

Constructive or Active Learning \neq Groupwork.

- **Constructivism:** A broad educational theory that students' learning builds (constructs) on prior knowledge. Since we don't know what's in their head, learning will be more effective when students are actively engaged.
- **Active Learning** refers to teaching strategies which aim to engage the students, including class discussion, think-pair share, and...
- **Groupwork**

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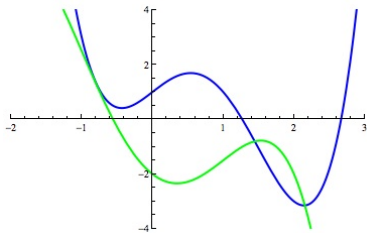
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Our Backgrounds

CSE Calculus, UMTYMP, Illinois, Michigan, Minnesota

Example 3a.



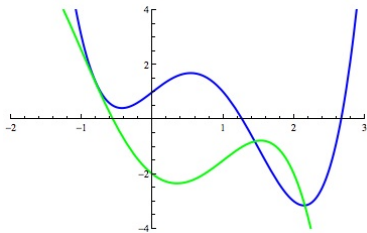
Suppose that the graph of f is shown in blue.

Suppose that the graph of g is shown in green.

What is the sign of $(fg)'(1)$?

- A** $(fg)'(1) < 0$
- B** $(fg)'(1) = 0$
- C** $(fg)'(1) > 0$
- D** can't tell from the information given

Example 3b.



Suppose that the graph of f is shown in blue.

Suppose that the graph of g is shown in green.

What is the sign of $(fg)'(1.4)$?

- A** $(fg)'(1.4) < 0$
- B** $(fg)'(1.4) = 0$
- C** $(fg)'(1.4) > 0$
- D** can't tell from the information given

Designing Groupwork Activities

- What's the goal? Basic computational practice? Deeper thinking?
- How does this build on the students' background?
- Make the groupwork genuine and versatile.
- What's the punchline?

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Groupwork is not a cure-all!

Using groupwork doesn't automatically improve your class.

Instructor buy-in is *vital*.

Guidelines for Groupwork

(See handout)

- Students should physically be in a group.
- How should you form your groups? There's no optimal answer!
 - ▶ Don't isolate.
 - ▶ Actively rearrange groups as needed.
 - ▶ What can you do with the fastest and slowest groups?

More Guidelines

- Don't be afraid to let groups struggle and make mistakes.
- Answer questions with questions.
- Have groups write their answers on the board from time to time. (Or work at the board the entire time.)

Groupwork in Different Settings

- Know the parameters: your style, your students' style, course guidelines.
- **Dedicated workshops:** the entire time is spent on group work, and that's what the students signed for.
- **Traditional setting:** group work can be incorporated into almost any class style.

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