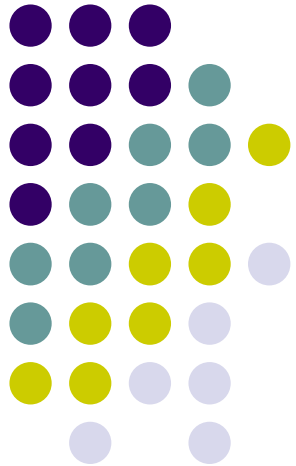
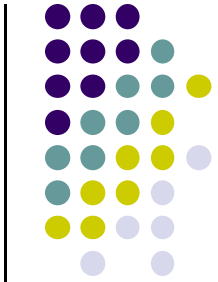
Introduction

What is MATH 4010 about?



Warm-up



- Please take a few of minutes to read the warm-up problems. Once you had time to do that, you are welcome to share your thoughts/solutions with the group members.

- We will discuss what you come up with in about 15 minutes.

Multiplication

- How did the students get each of these numbers?

49	49	49
× 25	× 25	× 25
405	225	1250
108	100	25
1485	325	1275

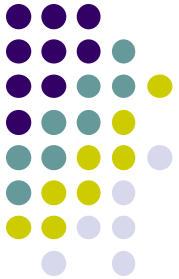
Division

- How do you solve a problem like this one?

$$1\frac{3}{4} \div \frac{1}{2} =$$

What would be a good story problem for $1\frac{3}{4} \div \frac{1}{2}$?

Decimals

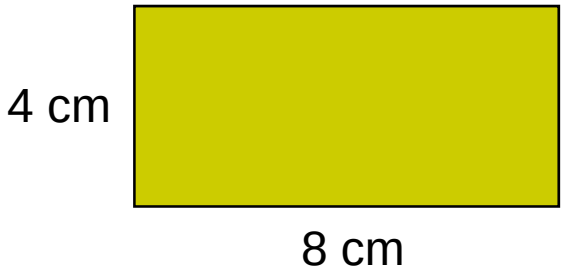


1. .5 7 .01 11.4
2. .60 2.53 3.12 .45
3. .6 4.25 .565 2.5
4. These lists are all equally good for assessing whether students understand how to order decimal numbers.

Investigations

- Imagine that one of your students comes to class very excited. She tells you that she has figured out a theory that you never told the class. She explains that she has discovered that as the perimeter of a closed figure increases, the area also increases. She shows you this picture to prove what she's doing:

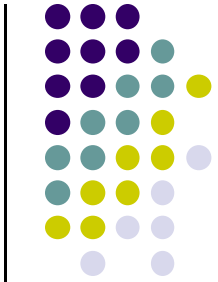
Perimeter = 16 cm
Area = 16 square cm



Perimeter = 24 cm
Area = 32 square cm

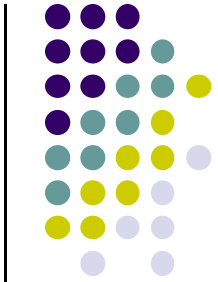
How would you respond to this student?

Questions



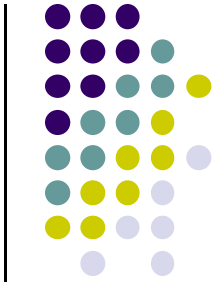
- Why do you think I chose to start the class this way?
- Why do you think I chose the questions in this particular way?

Learning mathematics



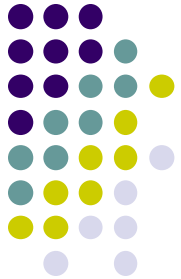
- Learning mathematics as a student:
  - Learning for your own understanding
  - Making sure you can solve the problems, do your own work
- Making a transition to learning mathematics as a teacher
  - Learning not just so you understand, but so that you can attend to others' learning
  - Practicing talking mathematics
  - Focusing on explanations and reasons
  - Developing multiple ways to represent, solve, explain.

Course goals



- Focus on content and applications: learning mathematics for teaching
- Unpacking mathematical ideas
- Developing mathematical practices
- Getting familiarized with elementary curriculum

Mathematical content

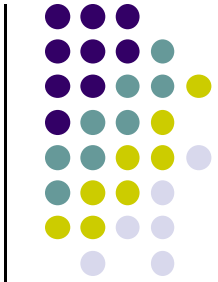


- Problem solving
- Sets: operations, relations, number sets
- Whole numbers: operations
- Number theory
- Fractions
- Decimals
- Real numbers
- Patterns and functions

Course work

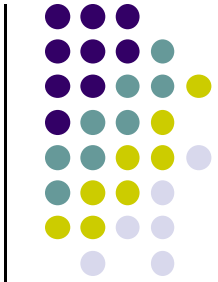
Assignments/quizzes, portfolio	20%
Midterms (2)	36%
Final	25%
Practicum report	15%
Attendance	4%

Your work



- Read your textbook!
- Portfolio – will count as 2 assignments
- Assignments – one due each Wednesday at the beginning of each class. At the end – quiz.
- We will be developing community documents. You will be required to meaningfully contribute to those.
- Homework

Dinosaur problem

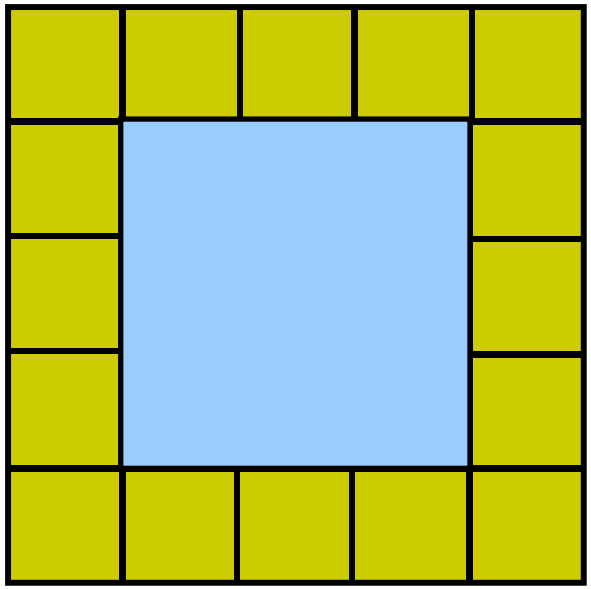


- First part of the problem
- Take a couple of minutes to solve the problem
- Second part of the problem

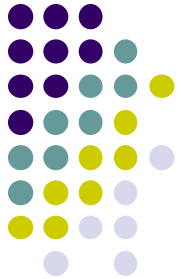
Pool border problem

- How many 1 by 1 (square) tiles does it take to make a border around a square pool?

  • What was the first thing you did?
  • How did you think about the problem?
  • How did you approach the problem?
  • How big is the pool?
  • How many different methods can you find to solve this problem?



Strategies used?



- Add your own. I remember these ones:
  - Draw a picture
  - Consider a special cases, then generalize
  - Look for a formula

To think about:

- How many 1 by 1 tiles does it take to make a border around a square pool?

We have a method to find the number of tiles: If S was the length of the pool then it would take

S+S+S+S+4

tiles to make a border.

Can you think of other methods to decide how many tiles you need for the border of any size pool?