

There will be Midterm Exam on Nov 2nd in class.

The exam will consist of three questions:

**Question 1:** A student's solution to a math problem will be given. You will have to mark the student's errors and write a quick feedback to the student as you would do as a teacher. You will give your own solution and answer to the problem. The problem will be taken from grade 9-12 math curriculum.

**Question 2:** A problem from *Calendar* section of *Mathematics Teacher* will be given. You will have to write a one page dialog with an imaginary student on how to approach this problem, and give a set of questions leading the student to the solution of the problem. You may assume that you have technology/manipulatives etc at your disposal. You can familiarize yourself with problems/solutions posted on my webpage ahead of time. (You will not be given the solution at the exam time.)

**Question 3:**

The following table contains various methods or teaching tools (second column) which can be used in a mathematics classroom. The first columns indicates general theoretical framework for the method justification. Your task is to give a concise description of the methods and supporting them theoretical perspective as you understand them from reading your book and the in-class presentations.

In the last two columns I ask you to elaborate on what do YOU think are the implications for the nature of pedagogical and mathematical knowledge of a teacher who is using each of the methods. The first row is just an example.

During the exam each of you will be given **one** of the following Theory-Method combinations and will reproduce your response in full details (about 200-300 words). Your arguments ought to be specific, logical and conclusive.

Theoretical perspective: paradigm, main idea.	Method (tool) in view of the theoretical perspective	Implication for pedagogical knowledge	Implication for the nature of mathematical knowledge
<i>Behaviorism</i> is a theory of learning focusing on a habit (response) development in a course of repetitive stimuli.	<i>Drills and practice</i> is a method of repetitive exercising aiming at development of certain skill to a high degree of automaticity. Focus is placed on learning algorithms and facts memorization and retention.	Teacher has to select and organize thematic units of exercises targeting concrete ability, e.g. algebraic manipulations. Assessment focuses of the speed of the pupils' performance and the proportion of correct answers.	Teacher has to have a good sense of mathematical similarity in order to combine problems according to his/her target, (e.g. problems requiring completing the square and consequent simplification of an algebraic equation). Teacher has to know the limitations of the method and provide counter-examples or situations when the technique is not applicable. Teacher provides tips about how to memorize facts and perform in an economical way (e.g.SOHCAHTOA).

Constructivism	Problem solving		
Socio-cultural approach	Scaffolding		
Different kinds of understanding ( e.g. Instrumental vs. relational, etc)	Inquiry approach		
Constructivism	Teaching with mathematical applications		
Socio-cultural approach	Funneling and Focusing		
Curriculum components	Integrated curriculum models		
Assessment as a part of learning process	Reach assessment task and rubric		
Gender construction theory	Gender-sensitive practice		
Social /cultural justice	Accommodation approach		
Mixed-ability classroom management	Diagnose of learning difficulties		
Mixed-ability classroom management	Identification of talented students		
Home-school-community partnership	School-centered approach		
Metaphors of technology (master, servant, partner, and extension of self	Use of graphing calculators or <i>Geogebra</i> or computer algebra system (like <i>Maple</i> )		