EDSS 386A and EDSS 386B Weekly Homework

1. Briefly outline and discuss your observations and ideas useful and relevant to the reading. It may include but not limited to the questions you may want to discuss during the class. It should be minimum ½ page single spaced. These reading assignments are intended to keep you accountable for course readings and help you process the readings individually and determine how theoretical concepts can be directly applied to classroom practice or course assignments.

2. Notes from the quiz. This is not required but highly recommended. Please do not just copy and paste every quiz problem into the homework. It should be maximum one page.

3. Response to the following question:

4. Response to the following question:

5. Solve the following math problem at least one way. In order to build a deep, conceptual understanding of the mathematics you will be teaching your students, you will be solving a variety of complex, conceptually-based mathematics problems throughout the semester based on concepts in the elementary mathematics curriculum. You will solve these problems in a way that highlights your conceptual understanding, record the processes you used to solve the problems, and justify your problem-solving strategy. The focus is on developing, explaining, and defending a mathematical argument for your solution. Since conceptual understanding is emphasized, using memorized algorithms is not an option. You won’t get penalized for getting a wrong answer if you follow the directions above. You will be penalized, however, if you just write “I don’t know.”


Week 02 Read Chapter 1 (1) I

1. Please see above.
2. Please see above.
3. Why did you choose to enter the teaching profession and teach mathematics? In what ways might your reasons for becoming a mathematics teacher influence your beliefs about education?
4. What does it mean if someone suggests that you “place problem solving at the focal point” of your mathematics classroom? How is this different from what we have traditionally experienced in the teaching and learning mathematics?
5. a. Three halls contained 9,876 chairs altogether. One-fifth of the chairs were transferred from the first hall to the second hall. Then, one-third of the chairs were transferred from the second hall to the third hall and the number of chairs in the third hall doubled. In the end, the number of chairs in the three halls became the same. How many chairs were in the second hall at first?
b. Mr. Jones has two children. The older child is a girl. What is the probability that both children are girls?

c. Mr. Smith has two children. At least one of them is a boy. What is the probability that both children are boys?

**Week 03 Read Chapter 2 (2)**

1. Please see page 1.
2. Please see page 1.
3. Identify a mathematical concept, such as finding the area of a trapezoid or area under a curve, using the Pythagorean Theorem, or solving quadratic equations. Research and present methods to teach the mathematical idea in a meaningful way so that students develop not only the skill but also deep conceptual understanding.

4. Consider the following scenarios: One teacher of a mathematics class gives the students daily homework and weekly tests, and bases grades on these products. Another teacher of the same course has students write in journals, assigns them quarterly projects, and has them keep a portfolio of their work, in addition to giving them homework and administering tests. Discuss the differing messages that students get about what is valued and important in each of these classrooms.

5. A slab of soap on one pan of a scale balances $\frac{3}{4}$ of a slab of soap and a $\frac{3}{4}$ pound weight on the other pan. How much does the full slab of soap weigh?

**Week 04 Read Chapter 3 (3)**

1. Please see page 1.
2. Please see page 1.
3. Obtain a secondary or middle school mathematics textbook. Choose a unit or chapter and review it in light of current learning theory. Does the book, for example, appear to follow Bruner’s stages of learning by suggesting an initial concrete experience? Does the book provide student activities that appear to be inquiry based or constructivist in nature?

4. When a student chooses not to complete required assignments or refuses to pay attention in class, we often hear it said that the student lacks motivation. In light of the three components of motivation described in this chapter, identify several possible reasons why the student might be failing to do the necessary work. Discuss some practical strategies that a teacher might use in an attempt to motivate the student.

5. In the barnyard is an assortment of chickens and pigs. Counting heads I get 13; counting legs I get 46. How many pigs and chickens are there?

**Week 05 Read Chapter 4 (4)**

1. Please see page 1.
2. Please see page 1.
3. The topic of multiplying polynomials was used as an example of how to deliver the same content at different levels for students at a variety of levels. Select another example of a secondary or middle school topic and show how that content area can be addressed using manipulatives, technology, or applied problems.

4. “The more things change, the more they stay the same.” Discuss how trends in education have come and gone over the course of history and how this pendulum effect impacts the implementation of innovative curricular changes.

5. Draw picture that show the explanation for this story.

Joy ran 3/4 of mile each day for 12 days. How many miles did he run?

**Week 06** Read Chapter 5 (5) 6

1. Please see page 1.

2. Please see page 1.

3. Suppose that you want students to become proficient at working with square roots. Write three objectives involving the use of square roots – one at the knowledge and skill level, one at the concept level, and one at the application level.

4. Using a computer with Internet access and a search engine such as Google, run a search for teaching ideas on the mathematical topic of your choice. Then discuss the difficulties that may have confronted you while running the search and the practicality of using the Internet to find teaching ideas.

5. Many problems can be solved in different ways. Decide if the following word problems can be solved using multiplication. Explain your thinking.

   a. Liam is cooking potatoes. The recipe says you need 5 minutes for every pound of potatoes you are cooking. How many minutes will it take for Liam to cook 12 pounds of potatoes?

   b. Mel is designing cards. She has 4 different colors of paper and 7 different pictures she can glue on the paper. How many different card designs can she make using one color of paper and one picture?

   c. Nina can practice a song 6 times in an hour. If she wants to practice the song 30 times before the recital, how many hours does she need to practice?

   d. Owen is building a rectangular tile patio that is 4 tiles wide and 6 tiles long. How many tiles does he need?

**Week 07** Read Chapter 6 (6) 5

1. Please see page 1.

2. Please see page 1.
3. Choose a general unit topic, such as exponential growth, area of a polygon, or total surface area and volume of three-dimensional solids, and create a conceptual map indicating the possible components of the unit and how they are connected.

4. Most teacher candidates and inservice teachers are familiar with spiral-bound lesson planning books that have a grid of small squares (roughly 2 inches on a side) into which the plan for a given day is to be written. Do you believe that lesson plan books of this kind are ever appropriate? Why or why not?

5. If there are nine people in a room and every person shakes hands exactly once with each of the other people, how many handshakes will there be?

**Week 08**  There is no class meeting this week. We will meet at the Asilomar Conference on December 1st for this day’s class.

**Week 09**  Read Chapter 7 (7)

1. Please see page 1.
2. Please see page 1.
3. Select a topic such as measuring angles or determining a limit. Consult at least three different sources, for example, journals, the Internet, resource books, or a textbook, and choose what you consider to be the best activity for developing the concept. Support your choice by explaining what makes your choice more worthwhile than other possible activities.

4. Select a classroom manipulative from the following list: algebra tiles, base ten blocks, color tiles, Cuisenaire rods, fraction pieces, geoboards, miras, pattern blocks, and tangrams. Research the proper use of the selected manipulative and find examples of lessons and activities that make effective use of the tool. Demonstrate your selected materials to a small group.

5. Find the area of the figure below:

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12 inches

10 inches

15 inches

9 inches

20 inches
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Week 10  Chapter 8 (8 & 9) 8 & 9

1. Please see page 1.
2. Please see page 1.
3. Write your experiences with learning number sense and algebra in school. Discuss whether you had distinct courses (or major units) in these topics or whether they were part of an integrated curriculum and how the curriculum design influenced your learning.
4. Misconceptions in the study of probability are very common, and the topic is not as easy to teach as it would seem, through students often enjoy exploring probability. Use the Internet or library to identify recent research on how students learn probability, examples of common misconceptions, and classroom teaching strategies that can be used to counter these misconceptions.
5. Fourteen birds are sitting on a line at 7-foot intervals. How long is it from the first bird to the last?

Week 11  Chapter 9 (10) 10

1. Please see page 1.
2. Please see page 1.
3. Proficiency and other standardized testing is the topic of continual heated debates across the United States. In this chapter, several arguments in favor of and opposed to proficiency testing were presented. Take a stand for or against the notion that all students should pass a standardized proficiency test such as CAHSEE to graduate from high school and defend your position.
4. Sketch out a conceptual map for a unit on the topic of your choice. Then, design two different assessments for the unit. One of the assessments should be a more traditional but well-written test, and the other assessment should be a performance task such as a project or interview. Discuss the benefits and potential drawbacks of each method of assessment. How can developing the assessment as the first step in planning (backward design) help the teacher create a conceptual map and individual lessons?
5. How many squares on a chessboard?
   (hint: There are a lot more than 64 squares.)

Week 12  Chapter 10 (11) 11

1. Please see page 1.
2. Please see page 1.
3. Identify a state that has a statewide assessment, such as proficiency test or graduation test that must be passed for a student to receive a diploma. Consider question such as the following: Does the test measure important mathematics? Is it equitable? Has the state
been open regarding content and scoring of the test? Is it reasonable to assume that only students who can pass the test deserve to graduate?

4. Design a system for determining final grades in your class; include any categories of evidence that you wish and their weighing as percentages. Explain how the system is fair, equitable, and meets the criteria in the Assessment Standards and the Assessment Principle.

5. Work out whether this number of descendants is realistic. Here are some facts that you will need:

![Image of a cat with text: Cats can’t add but they do multiply! In just 18 months, this female cat can have 2000 descendants.]

**Week 13** Thanksgiving

**Week 14** Chapter 11 (12) 12

1. Please see page 1.
2. Please see page 1.
3. Suppose that you teach a heterogeneously mixed class of students and have one individual who is gifted and solves problems well beyond the abilities of the rest of the class. This student is likely to become bored and even to create discipline problems if required to follow the exact same plan as the rest of the class. Discuss some strategies that you might use to challenge the student within the regular classroom.

4. The notion that everyone is capable of learning mathematics (barring severe learning disabilities) is not universally embraced by all teachers. What do you believe about the extent to which all students can learn mathematics? What experiences in your life have shaped those beliefs?

5. Two men are each given a necktie by their respective wives as a Christmas present. Over drinks they start arguing over who has the cheaper necktie. They agree to have a wager over it. They will consult their wives and find out which necktie is more expensive. The terms of the bet are that the man with the more expensive necktie has to give it to the other as the prize.
The first man reasons as follows: winning and losing are equally likely. If I lose, then I lose the value of my necktie. But if I win, then I win more than the value of my necktie. Therefore the wager is to my advantage. The second man can consider the wager in exactly the same way; thus, paradoxically, it seems both men have the advantage in the bet. This is obviously not possible. Please explain how to resolve this paradox.

Week 15  Chapter 12 (13) 13

1. Please see page 1.
2. Please see page 1.
3. Discuss which of the strategies for obtaining ongoing professional development were most appealing to you and why. Which professional experiences do you believe are most valuable for inservice teachers?
4. It has been said that it takes 10 years to make a person into a teacher. What does this statement say to you? Do you agree or disagree with this and why?
5. A farmer purchased 749 sheep. He sold 700 to another farmer for the same price that he paid for the 749 sheep. He then sold the remaining 49 sheep for the same price per sheep that he received from the 700 sheep. How much profit in percent did he make?