

SIMON FRASER UNIVERSITY

Exam Preparation: Strategies for Success in Mathematics Courses and other Q-Courses



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Are you here to find the secret formula to guarantee success in a Q-course?



Getting to know you...

In what types of courses do you feel confident?

Why?

In what types of courses do you feel less confident?

Why?

Thought:

Mathematics is not a spectators sport.

George Polya (1887-1985)

Difference between Q-courses and other courses:

- New topics are built on older topics solid foundation of prerequisite material is essential.
- Math is learned by doing problems. Do the homework.
- You are expected to read the text, work through examples, practice more than just the assigned homework questions.
- I hour of lecture \longrightarrow 3 hours of study
- Cramming for exams will not work!

Once upon a time...

What concerns do you have about writing a mathematics (or other science) exam?

Have you thought about:

- How many days do you plan to study for final exams?
- When do you plan to start studying?
- Will you study in a group, by yourself, or a bit of both?
- Have you picked up your marked homework assignments and exams?
- Have you checked your homework solutions for ALL questions?
- Did you revise your midterm tests?
- Will you try enough of the HARD problems in the text?

Thought:

If you keep doing what you've always done, you'll keep getting what you've always got.

Zig Zigler

What can I do now to prepare for Exams?

- Attend classes!
- Learn from past mistakes
 reflect on homework and midterms
- Regular review review wisely!
- Use the text; examples, exercises, review questions
- Optimize your learning style; manage your time! (eg. don't just work on easy problems)
- Develop your own practice questions and exams!
- Develop and follow a study schedule
- Prepare you own "cheat sheet" (study sheet)





<u>Preparing for Exams</u> What Should You Try:

- Start well in advance and review often.
- Identify your weaknesses (in understanding)
- Study "from the top down" (big concepts to specific examples)
- Study by stimulating your memory. (what examples are illustrating this concept? Definitions?)
- End each study session with 15 minutes of reflection
- Practice writing exams
- Take in no new material the night before an exam
- Expect the unexpected! (eg. new questions, "What if...")

Pre-Exam Plans:

- nutrition (food, fluids)
- rest (relaxation & sleep)
- wake-up routines
- transportation; Don't be late!
- date, time, and location of exam (know where to find it!)
- review study sheet; overview of course
- isolation (reduce distractions; focus)
- equipment (pens/pencils, eraser, ruler, calculator, ...)
- game plans: exam rituals & strategies

Ritual:

A set of actions thought to have symbolic value.

Purpose:

- to calm, relax, focus, provide a centered state of mind
- to put you more in control of the situation

Strategy:

A plan of action designed to achieve a particular goal.

Purpose: • to maximize results (grades/performance)



Some examples of rituals/strategies:

- positive affirmations ("I will do well on this exam.")
- using same pen/pencil/eraser/ruler
- rubbing earlobes, clapping hands (best done discretely)
- read ALL exam questions before beginning choose to begin with the easiest question
- have a plan if you begin to panic close eyes, breath

What are your rituals and/or strategies?







Focus on working on problems

STEP I. From the instructor gather information about what to expect.

- What fraction of the exam corresponds to material on first midterm?
- What fraction of the exam correspond to material on second midterm?
- What fraction of the exam corresponds to material covered since the second midterm?

- Will definitions and theorems be asked for?
- Is any kind of calculator permitted?
- Is there a specific practice exam or exams supplied by the instructor?

STEP 2. Gather a large collection of problems and exercises, and solve them

- Possible sources:
- recent final exams
- recent midterm exams
- problems worked by the instructor in lecture notes
- problems supplied by the instructor for purposes of review
- Which sources are best depends on the particular instructor. Working on recent final exams almost always pays dividends.

STEP 3. Classify the problems

- · Organize course material into categories.
- Identify key concepts and techniques covered in each category
- List the methods and tricks which are useful in each category
- Determine to which category the problem belongs and the concepts/techniques used to solve the problem

Example: Some categories for calculus are

- Finding limits Using rules of differentiation Continuity
- Related rates
- Interpreting graphs
- Curve sketching
- Exponential growth and decay Max/Min problems
- Max/Min problems

Example: Identifying problems that are related

Problem I:

Ms. Jones has chickens and horses on her farm. Altogether there are 50 heads and 140 legs. How many horses are there.

Problem 2:

Jenna has \$5.40 in nickels and dimes. How many nickels does she have if she has a total of 75 nickels and dimes.

category: systems of linear equations method: elimination or substitution

Example: a question from Precalculus or Physics

The height of an arrow t seconds after it is fired is given by $L(4) = 94^2 + 494 + 199$

 $h(t) = -8t^2 + 48t + 128$

Determine the maximum height of the arrow and the time t it reaches this maximum height.

category: Quadratic functions method: find the vertex

Step 4. Practice, practice, practice

- Put aside the answers to the problems
- Practice actually writing out the solutions
- Check that you have obtained the right answer and that your solution is enough for full marks

Summary:

- The same kinds of problems recur again and again on exams
- Learn to see connections between the problems and the concepts covered in the course.
- Learn to recognize at once common types of problems and have at your fingertips the methods and tricks that go with them
- The only way to get the facility you need is to have practiced each category enough
- Do not throw away easy points on offer for knowing definitions and theorems

I hear, and I forget I see, and I remember, I do, and I understand, I reflect, and I improve. (Chinese Proverb)

Magic Key

- 1. Start studying from the first day of the semester, and have a plan.
- 2. Read the textbook, and other required or recommended material.
- 3. Do your homework!
- 4. Treat your homework and midterms as learning opportunities: pick up and revise your papers, make sure you understand your mistakes.
- 5. Organize a study group. Learn to ask questions!
- 6. Review periodically don't wait until the end of the semester!
- 7. Develop your own exam rituals and strategies, and mentally rehearse them in days prior to the exam.
- 8. Don't cram!
- 9. Plan last days before your exams wisely, making sure that you have enough sleep and eat properly.
- Exercise helps. So does music (listening to Mozart is supposed to help with math and logical thinking).

