

Study Guide for Final Exam

The final exam is 120 minutes long and will be given on Thursday at 4:30 and Friday at 2:00 & 4:30. **The test will be given in Building 3, Room 142.** Please arrive early to get checked in so that you get the entire two hours to work on the test. The test will cover all of material since the beginning of the course. To study for this test, go through your homework, quizzes, and StudyPlan. The test is closed book and closed notes. You will need your calculator for the test. You may not share calculators or use mine. Please seek help in the Math Lab early and frequently.

Be familiar with the instructions specified in the homework and study guide. The wording on the test will be similar. It is important to not just know how to do a problem, but to understand what exactly the problem is asking you to do. **Some problems with multiple parts will span several sections and chapters.** Some examples are included in this study guide.

**You must bring a photo ID and a calculator to the exam.
Students without a photo ID will not be allowed to take the exam.**

**Make sure you sign up online to take the test by Monday,
December 7 at 11:00 pm.**

Any use of other electronic devices such as cell phones and mp3 players will result in a 0 on the exam.

Below are some problems and instructions that are representative of the types you will see on the test. See your textbook and homework for additional problems.

1. Solve the system by substitution. If the system is inconsistent or dependent, say so. Verify your solution by checking that it satisfies both equations in the system (if applicable).

$$\begin{aligned} 6x - 5y &= -8 \\ x + 3y &= 14 \end{aligned}$$

2. Solve the system by elimination. If the system is inconsistent or dependent, say so. Verify your solution by checking that it satisfies both equations in the system (if applicable).

$$\begin{aligned} 6x - 9y &= -3 \\ -10x + 15y &= 5 \end{aligned}$$

3. Factor. If the polynomial is prime, say so. Show all work for full credit. Circle your final answers.

a) $x^2 - 11x + 18$	b) $2x^2 + 20x + 42$
c) $25x^2 - 16$	d) $x^2 - 4xy - 21y^2$
e) $5x^5 + 45x^4 + 70x^3$	f) $3xy^2 - 48x$
g) $-x^2 - 4x - 3$	h) $3x^3 + x^2 + 27x + 9$

4. Solve. Write your answers as integers or simplified fractions. Show all work & circle your answers.

a) $\frac{5}{x} + \frac{3}{x-2} = \frac{7}{x}$	b) $\frac{w}{w+2} + \frac{7}{w-5} = \frac{14}{w^2-3w-10}$
c) $-x^2 - x + 3 = -9$	d) $(x+1)(x-2) = 4$
e) $-\frac{1}{2}x^2 + \frac{7}{2}x + 12 = 3$	f) $2x^3 - 3x^2 - 50x + 75 = 0$

5. Perform the indicated operations. Write your answers using integers or simplified fractions. Show all work and simplify your answers. You may leave your answers in factored form, as appropriate.

a) $(4p + 8q) + (4p - 9q)$	b) $(3t - 5w)^2$
c) $\frac{5}{x} + \frac{3}{x-2} - \frac{7}{x}$	d) $-5xy(3x^2 - 7xy + 9y^2)$
e) $2(x + 3)^2 - 4$	f) $5p^3t(-6p^3t)$
g) $(11x - 7) - (5x + 8)$	h) $(5x - 4y)(3x - 6y)$
i) $\frac{-6x+36}{x^2+7x+12} \cdot \frac{x^2-16}{-3x+19}$	j) $\frac{x^2-64}{x^2-9x+20} \div \frac{x^2-15x+56}{x^2-4x-5}$

6. Simplify. Use integers or simplified fractions in your answers. Show all work & circle your answers.

a) $\frac{48x^6y^4}{8x^5y^{-3}}$	b) $\frac{\frac{3}{x^2-16}}{\frac{4}{x+4}}$	c) $(4x^{-2}y)^3$
d) $-5c^4(c^2)^5$	e) $\frac{5-\frac{3}{x}}{4-\frac{1}{x}}$	f) $\frac{(2a^{-6}b)^{-3}}{(3cd^{-2})^2}$

7. A batter hits a baseball ball into the air. The height h (in feet) of the baseball after t seconds is given by $h = -16t^2 + 80t + 4$.

a) Predict when the baseball is at a height of 68 feet. Show all work and write your answer in a complete sentence in the context of the problem.

b) How high is the baseball after 2 seconds? Show all work and write your answer in a complete sentence in the context of the problem.

8. In 2003, Americans consumed an average of 16.3 pounds of fish and shellfish per year. What is this average in ounces per day?

- a) Translate and solve.
- b) Write your answer in a complete sentence.

Equivalent Units

Length

- 1 inch = 2.54 centimeters
- 1 foot = 12 inches
- 1 yard = 3 feet
- 1 mile = 5280 feet
- 1 mile \approx 1.61 kilometers

Volume

- 1 cup = 8 ounces
- 1 quart = 4 cups
- 1 quart \approx 0.946 liter
- 1 gallon = 4 quarts

Weight

- 1 gram = 1000 milligrams
- 1 pound = 16 ounces

Time

- 1 year \approx 365 days

9. The weight of an object on Planet A and the weight of the same object on the Planet B are proportional. An astronaut who weighs 180 pounds on Planet A weighs 22.5 pounds on the Planet B. What is the weight of a person on Planet A if they weigh 28.9 pounds on the Planet B? Round your answer to the nearest integer as needed.

10. The numbers of men and women who earned a bachelor's degree are listed in the table below for various years. Let n be the number of people (in thousands) who earned a bachelor's degree in the year that is t years since 1980.

Year	Number of People Who Earned a Bachelor's Degree (thousands)	
	Women	Men
1980	456	474
1985	497	483
1990	560	492
1995	634	526
2000	708	530
2002	742	550

Reasonable models for the women and men are

$n = 13.28t + 440.09$	Women
$n = 3.42t + 468.14$	Men

Use substitution or elimination to estimate when the number of women who earned a bachelor's degree was equal to the number of men who earned a bachelor's degree. What was the number of people?

Remember to show all work and answer the question in a complete sentence for full credit.

Round your intermediate answers to two decimal places and final answers to the nearest counting numbers.

11. In addition, there will be a problem that you have never seen before. Use what you have learned in this class in addition to your problem solving skills to solve it and explain.

There will be an extra credit quiz posted in MyMathLab that is due at 11:00 pm on Wednesday, December 9. These are additional problems similar to the ones above. The extra credit is worth up to 10 points on your final. The number of points will be determined by the tens digit (or tens and hundreds digit in the case of 100%) of your quiz score. You will get three attempts as usual. Try to do it without help the first time to see if you really understand the material.

Examples of extra credit points:

9 points for a score of 98.2%, 5 points for a score of 52.8%, 10 points for a score of 100%