

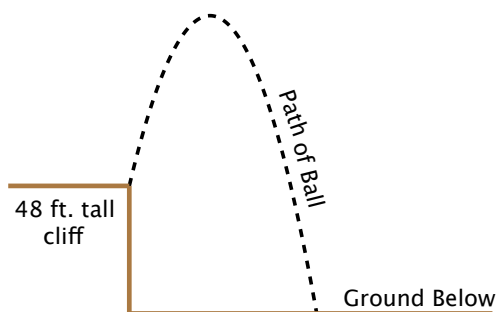
Math 98 Final Exam Practice Problems

The final exam covers **all of the sections** covered in the course, but will emphasize the material from sections 11.6, 11.7, and 12.1-12.3. You will have 75 minutes for the exam and can use a calculator and a notesheet (8.5×11 , both sides, handwritten).

There will be a take-home portion of the final exam consisting of 3 problems from the material in sections 12.4, 12.5, and 12.6. These problems will make up 12% of the final exam score.

Here are **some** practice problems for sections 11.6, 11.7 and 12.1-12.3. For additional practice problems on sections from chapters 10 and 11, see the practice problems from Exams #1 and 2. You should also look at previous homework problems and worksheets.

1. Review at the end of chapter 11 (Pgs. 793): 47-56, 58, 59
Review at the end of chapter 12 (Pgs. 864-865): 1, 2, 4-11, 13, 14, 16-24
2. Bert kicks a soccer ball up into the air with an initial velocity of 64 feet/second from the edge of a 48 foot cliff. The height of the ball above the ground below is given by $h = -16t^2 + 64t + 48$ in feet at t seconds.



- (a) When does the ball land?
- (b) When does the ball reach its maximum height? What is the maximum height?

3. $f(x) = 2x^2 + 8x + 5$
 - (a) The graph of f is a parabola. What is the vertex of the parabola?
 - (b) Draw the graph of f on the axis below. Include 2 points other than the vertex.
4. Evaluate the following.
 - (a) $\log_5 125 = ?$
 - (b) $\log_{11} 11 = ?$
 - (c) $\log_4 1 = ?$
 - (d) $\log_8 4 = ?$
5. Fill in the following table by writing the exponential or logarithmic form for the corresponding equation.

Exponential Form	Logarithmic Form
$2^4 = 16$	
$3^{-5} = \frac{1}{243}$	
	$\log_7 343 = 3$
	$\log \frac{1}{100} = -2$

6. Find the inverses for the following functions.

(a) $f(x) = \sqrt{x+1}$ (Be sure to consider the domain and range of the function and its inverse.)

(b) $g(x) = 2x^3 - 4$

(c) $h(x) = \log_5 x$

7. Graph the functions $F(x) = 5^x$ and $G(x) = \log_5 x$.

8. Solve the following equations for the variable x .

(a) $4^x = \frac{1}{16}$

(b) $9^{6x} = 27^{x+1}$

(c) $\log_8 x = 2$

(d) $\log_x 216 = 3$

9. You fire a cannonball upward so that its distance (in feet) above the ground t seconds after firing is given by $h(t) = -16t^2 + 144t$. Find the maximum height it reaches and the number of seconds it takes to reach that height.

10. A (fictitious) survey of the squirrel population on the Shoreline campus is conducted and it is found that 1200 squirrels are present on campus this quarter. It is projected that the population of squirrels on campus can be described by the following exponential function: $s(t) = 1200(3)^t$ where t is the number of years after the survey is conducted.

(a) How many squirrels can we expect to have on campus 8 years after the survey?

(b) When can we expect to have 97200 squirrels on campus?