This final exam is provided to give you a sense of the type of questions I might ask. Your final will be slightly longer and worth 120 points and will have 6 questions on mathematical techniques (worth 10 points apiece), 8 short-answer questions on history (worth 5 points apiece) and two short essays (worth 10 points apiece).

Math 570 Final Examination
May 15, 2002

Questions on mathematical technique. You must show your work to receive credit.

1. Solve the equation $x^3 + 6x^2 + 21x + 10 = 0$ (give the exact solution, not a decimal approximation).

2. Compute the following using logarithms (show your work).
   a. 32.7×6.93
   b. $\sqrt[3]{27.6}$

3. Compute gcd(399,525).

4. In *Merrill* Algebra I, the following technique is given for computing $(2x^2 + 5x - 1)(x^2 - 2x + 3) = 2x^4 + x^3 - 5x^2 + 17x - 3$

	2	5	–1	
	2	5	–1	1
2	– 4	–10	2	–2
1	6	15	–3	3
–5	17	–3		

Explain how and why this technique works, and what historical technique it resembles. Will this technique extend to higher-order polynomials?

Short answer questions. Answers should be one or two sentences.

Sample: Briefly identify and describe the mathematical significance of Euclid.
Euclid worked at the Museum of Alexandria around 300BC. His Elements was the standard textbook in geometry for 2000 years.

5. Briefly identify and describe the mathematical significance of Euler (including the pronunciation of his name).

6. Briefly identify and describe the mathematical significance of Ptolemy.

7. Briefly identify and describe the mathematical significance of Wallis.

8. Briefly identify and describe the mathematical significance of Descartes.

9. What was distinctive about the Egyptian use of fractions?

10. In what works were negative numbers and complex numbers introduced?

Interpretation questions. Answers should be one or two paragraphs.

11. Identify the following passage (from one of the readings in the course packet) and explain its importance.

    Such an equation having been found, it is used, not to determine x, y, or z, which are known, since the point C is given, but to find v or s, which determine the required point P. With this in view, observe that if the point P fulfills the required conditions, the circle about P as center and passing through the point C will touch but not cut the curve CE; but if the point P be ever so little nearer to or farther from A than it should be, this circle must cut the curve not only at C but also in another point. Now if this circle cuts CE, the equation involving x and y as unknown quantities ... must have two unequal roots ... when the points (of intersection) *coincide, the roots are exactly equal, that is to say, the circle through C will touch the curve CE at the point C without cutting it.*

12. What changes occurred during the time between Diophantus and Cardano which led to the development of the cubic formula.

On my honor as a student, I have neither given nor received unauthorized aid on this academic work.

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(signature) (date)