Studying the Exam

The following questions have been proposed for a 50-minute midterm. Select the problems that you would use for the exam, giving reasons.

If you feel that there are some important gaps in the problems given, feel free to include problems of your own. If some of the problems need re-wording, feel free to do that also.

In constructing the exam, you should consider the following questions, as well as any others you think important.

- Is the exam the right length?

- Do the problems work out cleanly enough?

- Which questions will be hard to grade? What advice would you give to the graders of each problem?

- Is the exam balanced? In topics? In style of problem?

- Are the instructions to each question clear? Are there any that you think students could misinterpret?

- If the students are using calculators, how will this affect the way in which they approach each problem?

- What order do you think the problems you choose should be in? Do you think it matters?

- How will students do who know only the basics? Will they get some points? Few?

- How will students do who have worked hard and understood most topics, but not all?

- Which problems, if any, rely on students having got the first step right to be able to attempt the main part of the problem? What do you think about such problems?

- Should the students be given a choice of problems on the midterm?

Studying the Exam

College Algebra Questions

These questions are suggested for an exam on linear and exponential functions. Your discussion leader will let you know what technology (for example, graphing calculators) is available.

1. Solve for x: $2^x = 3$.

2. Solve exactly: $5^{2x-1} = 0.2$.

3. Find the value of x: $4^x - 2^{x+1} + 35 = 0$.

4. Find the equation of the line through the points $(5, 1)$ and $(-2, 3)$.

5. What is the equation of the line perpendicular to the line $y = ax + b$ and through the point $(2, 3)$?

6. Find the equation of the line parallel to the line $ay + bx = c$, but with double the x-intercept.

7. Graph $y = x^2$, $y = (x - 1)^2$, $y = x^2 - 1$, and $x = y^2 - 1$.

8. In 1996, about 80 out of 1000 obstetricians were sued for malpractice; in 1998, about 100 out of 1000 were sued. Assume that the percentage of obstetricians sued is a linear function of time, t, in years since 1996. Write a function giving the percentage of obstetricians sued as a function of t. (Source: RMF Quarterly, Spring 2000, newsletter of the Risk Management Foundation, Harvard Medical Institutions, 101 Main Street, Cambridge MA 02142.)

9. A ship is traveling at 20 mph along the line $y = 2x + 10$, starting at the point $(-10, -10)$ when $t = 0$. A small boat starts at the point $(0, 40)$, and travels along the line $y = 40 - x$ at 20 mph. Do the boats collide? If so, when and where?

10. Are the following statements true or false?

(a)

$$\frac{4a^0}{(12a)^{-1}} = 48a.$$

(b)

(c)

(d)

(b)

$$\sqrt{4p + 4q} \cdot \frac{1}{(q+p)^2} = 4(q+p)^{-2.5}$$

(c)

$$2x^2 + \frac{3+x}{x^2} = 5 + x$$

(d)

$$\log(A^3 + B^2) = 3\log A + 2\log B$$

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