MATH 22 SECTIONS 016 AND 019 NAME _____

MOCK EXAM I SOLUTIONS STUDENT NUMBER _____

FALL 2007 INSTRUCTOR _____

FORM A SECTION NUMBER _____

This examination will be machine processed by the University Testing Service. Use only a number 2 pencil on your scantron. On your scantron identify your name, this course (Math 22) and the date. Code and blacken the corresponding circles on your scantron for your student I.D. number and class section number. Code in your test form.

There are 20 multiple choice questions each worth five points. For each problem **five** possible answers are given, only one of which is correct. You should solve the problem, note the letter of the answer that you wish to give and **blacken** the corresponding space on the **answer sheet**. Mark only one choice; darken the circle completely (you should not be able to see the letter after you have darkened the circle). Check frequently to be sure the problem number on the test sheet is the same as the problem number of the answer sheet.

THE USE OF A CALCULATOR, CELL PHONE, OR ANY OTHER ELECTRONIC DEVICE IS NOT PERMITTED IN THIS EXAMINATION.

THE USE OF NOTES OF ANY KIND IS NOT PERMITTED DURING THIS EXAMINATION.

There are 20 problems on 8 pages, including this one.
Check your booklet now.

1. Solve the equation $\dfrac{1}{x^2} = \dfrac{16}{9x^2} + 7$.

   a) $x = +\dfrac{i}{3}, -\dfrac{i}{3}$

2. Solve the equation $P = 9l + 5w$ for l.

   a) $l = \dfrac{P - 5w}{9}$

3. I have a box of marbles. I discard six-sevenths of them and make a pile of the remaining, then subtract one from the pile, discard four-fifths of what results, subtract two from the pile, and then keep only a third of the marbles I have. I finish with one marble in the pile. How many were in the box?

   a) 182

4. What quantity of a 40% acid solution must be mixed with a 16% solution to produce 300 mL of a 24% solution?

   a) 100 mL

5. Solve the equation $x = 2(\sqrt{x} + 12)$.

   a) $x = 36, x = 16$

6. Find all real solutions of the equation $ax^2 - (2a + 1)x + (a + 1) = 0$, for $a = 3$.

   a) $x = \frac{4}{3}, x = 1$

7. The complex number $\dfrac{-8}{i+1}$ is a solution to which of the following equations?

   a) $x^2 + 8x + 32$

8. Find all solutions of the equation $x^2 - 4x + 5 = 0$.

   a) $2 + i, 2 - i$

9. Find all real solutions of the equation $\dfrac{2}{x} - \dfrac{3}{x-2} + 1 = 0$.

   a) $x = -1, x = 4$

10. Find all real solutions of the equation $\sqrt{x^2+11}+7=1$.

a) $5, -5$

11. Solve the inequality $\frac{1}{4} < \frac{2x-9}{8} \leq \frac{1}{2}$ and express the solution using interval notation.

a) $\left[\frac{1}{2}, \frac{13}{2}\right)$

12. Find all x that satisfy the inequality $221x^4 < (34x^2-64)221$.

a) $(-4\sqrt{2}, -\sqrt{2}) \cup (\sqrt{2}, 4\sqrt{2})$

13. Solve $|8x + 30| = 34$.

    a) $x = 0.5$ and $x = -8$

14. Solve the inequality $\left|\frac{x+4}{3}\right| \geq 3$.

    a) $(-\infty, -11] \cup [7, \infty)$

15. Find a point on the y-axis that is equidistant from the points $(13, 2)$ and $(12, -3)$.

    a) $(0, 2)$

16. Find the $x-$ and $y-$intercepts of the graph of the equation $y^2 = -2x^3 + 16$.

    a) $x-$intercept 2, $y-$ intercepts $4, -4$

17. Find the center and radius of the circle given by the equation $x^2 + y^2 - 16x - 8y = 89$.

    a) center $(8, 4)$, radius 13

18. Determine the correct equation for the line passing through the point $(-5, -13)$ with a slope of 3.

    a) $y = -3x - 28$

19. Determine the correct equation for the line passing through the point $(12, -11)$ and parallel to the line connecting the points $(-20, 1)$ and$(20, -119)$.

    a) $y = 25 - 3x$

20. Express the statement "y is directly proportional to x^5" as a formula. Use the information that if $x = -2$ then $y = 2$ to find the constant of proportionality.

    a) -64