MATH 132 Fall 02 Final Exam Name:

(*Each problem is worth 10 points.*) *Give exact answers and simplify your answers.*

Problem 1: A rectangle has width equal to twice its height. Write a formula for its area as a function of the length d of the diagonal.

Problem 2: On a 10 mile course, a runner is able to go 6 mph for the first half of the course and 4 mph for the second half. What is her average speed?

Problem 3: An investment of \$20,000 earned 5% each year for 6 years, then it lost 10% for each of the next 3 years. What is it worth now?

Problem 4: You flip 4 coins and are paid \$5 if you get 3 or more heads or 3 or more tails and no money otherwise. What is the expected pay off of this game?

Problem 5: Your beginning rent is \$400 per month, and then it goes up \$5 each month, so you pay \$400 the first month, \$405 the second, \$410 the third, etc. What is the total amount you pay in rent for 2 years?

Problem 6: Compute the quotient below and write your final answer in **scientific notation**.

$$\frac{4.2 \times 10^{-2}}{(6.1 \times 10^{-3})(2.3 \times 10^{-4})}$$

Problem 7: (a) A student received scores of 40, 35, 35, 45, 40 out of a possible 50 on their psychology class quizzes. Determine the mean, median, and standard deviation of these scores.

(b) What score do they need to get on the final quiz to have a mean of 40 for their six scores?

Problem 8: A geometric sequence has ratio equal to -3 and sixth term equal to 60. What is the first term of this sequence?

Problem 9: The number of cell phones in the US in millions is given by

year	1995	1996	1997	1998
millions of phones	15	27	36	42

Determine if the graph of this data is concave up or concave down.

Problem 10: Find $f(f(2))$ when

$$f(x) = \frac{x(x+1)}{x+3}$$

Problem 11: One bus company charges \$10 plus 50 cents a mile for each mile over 10. Another charges \$15 plus 25 cents a mile for each mile over 12. After how many miles is the second one a better deal?

Problem 12: Answer the following:

(1) $\log(x) = 4$, so $x =?$

(2) $\log(x) = -2$, so $x =?$

(3) If $\log(5) = A$, then $\log(50) =?$. Express your answer using the letter A.

Problem 13: (a) You are dealt four cards from the same deck. What is the probability that all four of them are red?

(b) What is the probability that all four of them are red or a king?

Problem 14: Sam is three times as old as his brother was 7 years ago. Six years ago his brother was half Sam's age. How old are Sam and his brother now?

Problem 15: A bank robber leaves the scene of the crime going a a rate of 30 mi./hr. The police leave from the scene 20 minutes later and they catch the robber after a half hour chase. At what rate do they need to travel to do this?

Problem 16: Have a good vacation! — No work is needed here.