COT 3100 Quiz #1 (Version A): d = rt, logs, Random Algebra, Roots of Polynomials

2/10/2025 (Recitation 21 Monday 8 am)

Last Name: _____ First Name: _____

1) (10 pts) If Tom leaves for work at 8 am, driving at an average speed of 40 miles per hour, he arrives at work 5 minutes late. If he leaves for work at the same time, but drives at an average of 50 miles per hour, he arrives at work 1 minute early.

(a) How far away is work from his house?
(b) What time is he supposed to arrive at work to be on time?

(a) _____ (b) _____

2) (10 pts) Solve for x in the following equation and express your answer in the form $a\sqrt{b}$, where a and b are both positive integers.

$$log_9(3x^2) + log_3(9x^4) = 10$$

x = _____

3) (10 pts) There are two times in between 7 pm and 8 pm that the smaller angle made by the hour hand and minute hand is exactly 90 degrees. At how many minutes after 7 pm does this occur for the first time? Please express your answer as a mixed fraction. (An example of a mixed fraction is $11\frac{2}{5}$.) Recall that both hands are continuously moving at the same rate.

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4) (10 pts) An online seminar has four assignments, A, B, C and D with A worth 10% of the course grade, B worth 20% of the course grade, C worth 30% of the course grade and D worth 40% of the course grade. Assignments A and B are out of 80 points and assignments C and D are out of 50 points. Kyle earned 48 points on assignment A, 72 points on assignment B and 21 points on assignment C. He would like to earn at least a 75% in the class. How many points does he need to earn on assignment D to hit this target exactly?

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5) (10 pts) Let r and s be the roots of the quadratic function $f(x) = x^2 - 4x + 20$. What is the quadratic function, with leading coefficient 1, with the roots $r + 2s$ and $s + 2r$?

Place any other work you would like graded below. Clearly mark which question(s) the work is for.