COT 3100 Quiz #1: d = rt, logs (Week of Feb 6, 2023) – R, F Version

Last Name: _____ First Name: _____

Circle Rec: R10:30am R4:30pm F11:30am

1) (8 pts) Trusty Tortoise and Roger Rabbit are taking a (same) journey. Trusty Tortoise travels at an average speed of 2 miles an hour and never stops on the journey. Roger Rabbit will spend 10 minutes traveling at an average speed of 5 miles an hour before taking a 20 minute break, and alternating this pattern. Find any distance, D_1, such that Trusty Tortoise wins the race, stating, with proof, the amount of time both Trusty Tortoise and Roger Rabbit take to traverse that distance. (Express both times in HR:MIN:SEC format.)

D_1 = _____ , Tortoise Time = _____ , Rabbit Time = _____

2) (8 pts) An arithmetic sequence of 30 terms has a sum of 765. If the common difference and first term of the sequence are both positive integers, what are the values of the first term and common difference? (Please put your answer on the given slots on the back of this page.

a_1 = _____ d = _____

3) (9 pts) Find the value of the following sum:

$$log_{1024}2 + log_{1024}4 + log_{1024}8 + log_{1024}16 + \cdots + log_{1024}(2^{20})$$

Note: $2^{10} = 1024$. Put a box around your final answer.