

Name \_\_\_\_\_

Each correct answer is accurate to the number of decimal places shown. For each problem, circle only the correct answer. You are not allowed to borrow another student's calculator during the quiz.

1. (4 points) This morning, Lois has invested \$600 in a bank account which earns 4.5% interest compounded continuously.
  - A. How much money will she have in her account 9 years from now?  
(a) \$899.58      (b) \$939.22      (c) \$948.51      (d) \$999.17      (e) \$1021.33
  - B. How long will it take for the balance in her account to reach \$1500?  
(a) 20.2 years    (b) 20.4 years    (c) 20.6 years    (d) 20.8 years    (e) 21.0 years
  
2. (3 points) Pregnant women metabolize some drugs at a slower rate than the rest of the population. The half-life of caffeine is about 4 hours for most people, but for pregnant women, it is 10 hours. (This is important because caffeine, like all psychoactive drugs, crosses the placenta to the fetus.) If a pregnant woman and her husband each have a cup of coffee containing 100 mg of caffeine at 8:00 AM, how much does each have left in the body at 10:00 PM?
  - (a) 35.9 mg for the woman, and 6.8 mg for her husband
  - (b) 37.9 mg for the woman, and 8.8 mg for her husband
  - (c) 39.9 mg for the woman, and 10.8 mg for her husband
  - (d) 41.9 mg for the woman, and 12.8 mg for her husband
  - (e) 43.9 mg for the woman, and 14.8 mg for her husband
  
3. (3 points) A culture of bacteria grows exponentially and triples in size every 6 hours. How long does it take to double its original size?
  - (a) 3.8 hours      (b) 4.0 hours      (c) 4.2 hours      (d) 4.4 hours      (e) 4.6 hours