

Name \_\_\_\_\_

1. (4 points) Given that  $1000e^{0.3t} = 3500$ ,

(a) find the exact value of  $t$  using logarithms.

(b) find an approximate value for  $t$  and round off your answer correctly to two decimal places after the decimal point.

2. (6 points) A large cup of coffee contains 150 mg of caffeine. Caffeine leaves the body at a rate of 16% per hour.

(a) Find a formula for the amount,  $A$  (in mg), of caffeine in one's body  $t$  hours after finishing a large cup of coffee.

(b) How much caffeine is in one's body 3 hours after finishing a large cup of coffee? Your answer should be rounded off correctly to one place after the decimal point.

(c) How many hours after finishing a large cup of coffee, will one's caffeine level be reduced to just 10% of the original 150 mg? Your answer should be rounded off correctly to one place after the decimal point.