

Math 111 Quiz #5

Name: _____

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Show all work and simplify as much as possible.

You can use a calculator on this quiz.

1. The city of Smithville* grows **exponentially** at a rate of 2% each year. In the year 1990, the city had a population of 250 million!
 - (a) (2 pts.) Give a formula for the population of Smithville, P , in millions, as a function of years, t since 1990.
 - (b) (2 pts.) What is the predicted population in the year 2030?
 - (c) (2 pts.) When will the population be 400 million? (Give me the exact answer and the decimal approximation.)

2. Solve the following equations. (Give the exact answer and the decimal approximation.)
 - (a) (2 pts.) $8(2)^x = 3^{2x}$
 - (b) (2 pts.) $\log_4(x + 1) = 2$

*Smithville is not a real city.