

MATH 1001, Population Growth Quiz, Spring 2003

Remember, there will be little or no partial credit given on questions in this quiz.

MULTIPLE CHOICE (2 points each).

1. a If I earn \$2 a day, and put it in my wallet, and don't spend any money, the "population" of money in my wallet grows according to a _____ model.

- a linear growth
 b Fibonacci Rabbit Breeding
 c exponential growth
 d black hole

2. a K.D. Nickels, a large department store, buys an item for \$50. They mark it up 90%, and then put it on sale for 30% off the marked-up price. What is the final cost of the item?

- a \$66.50
 b \$13.50
 c \$28.5
 d \$80.00

3. d You deposit \$1,500 in a bank account which offers 10% interest, compounded **more than once a year**. Which of the following choices could represent your balance after one year? (Four of the choices are unreasonable, based on the information given.)

- a \$1,650
 b \$1,500
 c \$1,515
 d \$1,700

4. Consider a population that grows according to a linear growth model. The initial population is $P_0 = 9$ and the common difference is $d = 11$. On a test, you might be asked to give the transition rule ($P_N = P_{N-1} + 11$) and/or the explicit description ($P_N = 9 + N \times 11$). As you can see, on this quiz I've done those for you.

a. (2 points) Find P_{10} . (Show your work).

$$P_{10} = 9 + 10 \times 11 = 9 + 110 = 119$$

b. (3 points) When will the population be 207? (Show your work).

$$\begin{aligned} P_x &= 9 + 11x = 207 \\ 11x &= 207 - 9 = 198 \\ x &= \frac{198}{11} = 18 \end{aligned}$$

So the answer is $x = 18$ months.

5. (4 points) You put \$2000 in a bank offering 5% interest compounded monthly. What will you have in the account after 3 years? (Show your work).

$$\begin{aligned} P_N &= P_0 \times \left(1 + \frac{i}{k}\right)^{N \times k} \\ P_3 &= 2000 \times \left(1 + \frac{.05}{12}\right)^{3 \times 12} \\ &= 2322.94 \end{aligned}$$