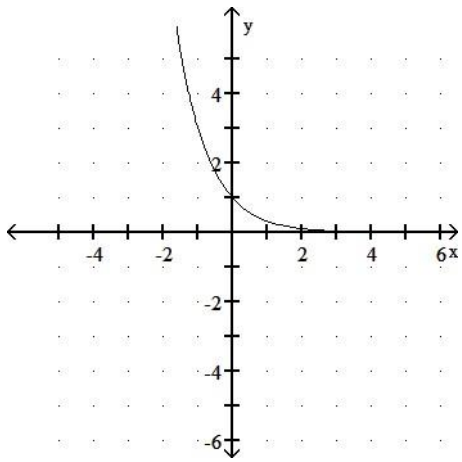
MTH-114 Review for Test 4 Luczak

1. An economist predicts that the buying power $B(x)$ of a dollar x years from now will decrease according to the formula $B(x)=0.95^x$. How much will today's dollar be worth in 3 years?
2. Use the formula $P=Ie^{kt}$. A bacterial culture has an initial population of 500. If its population grows to 7000 in 8 hours what will it be at the end of 10 hours?
3. Describe the base of the exponential function graphed here. What is the domain and range?



4. The number of book in a small library increases according to the function $B(t)=9200e^{0.03t}$, where t is time in years. How many books did the library have when it opened? How many will it have after 2 years?
5. Write in exponential form: $\log_4 \frac{1}{64}=-3$
6. Write in exponential form: $\log 0.0000001=-7$
7. Write in logarithmic form: $2,097,152^{\frac{1}{7}}=8$
8. Write in logarithmic form: $e^5=x$
9. Simplify as much as possible: $\ln e^{\ln x}$
10. Write as the logarithm of a single quantity : $9\ln x-\frac{1}{2}\ln y-3\ln(z+1)$
11. Write as a sum and/or difference of a logarithm with all variables to the first degree: $\log\frac{\sqrt{xy}}{z^5}$
12. What is the domain and range of $f(x)=\log(3-x)$
13. Solve: $\log_4(x-8)+\log_4(x-8)=1$
14. Solve: $\log(2+x)-\log(x-5)=\log 4$
15. Solve: $3^{7x}=81$

16. Solve: $5e^{5x+1} = 20$
17. How long will it take for a population to double if its annual growth rate is 0.7? Round to nearest year.
18. Find the simple interest earned on \$670 invested at 5% for $5\frac{1}{3}$ years.
19. Find the simple interest earned on \$2340 at 5.5% for 189 days.
20. Find the present value in an account earning 6% interest if it grows to \$20,000 after 3 months.
21. Allan borrowed \$4600 from his father to buy a car. He repaid him after 11 months with simple interest of 4%. Find the total amount he repaid his father.
22. A company has ordered 6 new PCs at a cost of \$1800 each. They will not be delivered for 2 months. What amount should the firm deposit into an account paying 7.32% simple interest to have enough money to pay for them.
23. Find the total amount you would have if you invested \$1000 at 8% compounded semiannually for 10 years.
24. Find the amount of interest earned on \$500 at 8% compounded quarterly for 6 years.
25. Find the amount of interest earned on \$14,000 at 7.3% interest for 9 months.
26. Find the interest rate that would allow \$4000 to grow to \$9316.58 in 12 years if interest is compounded annually.
27. Find the APY on an account that earns 6% compounded semiannually.
28. Find the APY on an account that earns 6% compounded daily.
29. Find the present value that should be invested at 7% compounded semiannually if after 8 years you have \$32,000.
30. Mark and Kate are establishing a fund for their daughter's college education. What lump sum must they deposit in an account that gives 5% annual interest rate, compounded monthly, in order for them to have \$85,000 at the end of 10 years.
31. Find the future value of an ordinary annuity where you deposit \$100 at an interest rate of 6% compounded annually for 12 years.
32. A person is saving for retirement and has invested \$300 per month at an interest rate of 4% compounded monthly, for 15 years. After the first 15 years they move that money into a new account. The new account earns 7% interest compounded monthly and they contribute \$600 per month for 15 years. How much money total will person have at the end of the 30 years?
33. Lou has an account with \$10,000 which pays 9% interest compounded annually. If to that account Lou deposits \$5000 at the end of each year for 5 years how much will he have in the account after the last deposit?
34. Which of the following investments is larger after 20 years:

    A: \$8750 deposited annually earning 4% compounded annually

    B: \$700 deposited monthly earning 4% compounded monthly