Exam #2 Review

1. Solve for x:

$$2 + (9.2)^{-8x} = 2.32$$

2. Solve for y:

$$3(y - 7)^{13} = 1540$$

3. Which will be worth more in 10 years: \$10,000 invested at 8.2% simple interest, or \$10,000 invested at 5% interest, compounded monthly?

4. Suppose a friend lends you \$100, and you agree to pay him back \$112 in 18 months. If we assume that this is simple interest, then what is the interest rate?

5. For an account with an annual interest rate of 6%, find the annual percentage yield (APY) if interest is compounded:

(a) quarterly **(b)** monthly **(c)** daily

6. A bank advertises a Certificate of Deposist (CD) with 4.8% interest, compounded monthly. If I invest \$3,500 today, how long will it take for my investment to grow to \$4,200?

7. Reba would like to make the \$2,150 down payment on a new car in 6 months. If she has \$2,000 in her savings account, and interest is compounded daily, what interest rate would she need to earn to have enough?

8. When Jed was born, his grandfather deposited \$1,982 into a savings account for his grandson, under the condition that nobody touches it until Jed turns 21. If this account earns 3.9% interest compounded semi-anually (twice per year), then how much will Jed have on his 21st birthday?

9. Many years later, Jed's granddaughter is born, and he would like to do something similar for her. He would like her to have exactly \$10,000 in the account on her 21st birthday. If the account earns 4.1% compounded annually, how much would Jed need to deposit on the day she is born?

10. It's never too early to start saving for retirement! Suppose you find a savings account that will pay 5% interest compounded monthly. If, starting on your next birthday, you deposit \$85 per month, and continue this until your 65th birthday, how much will you have in your account?

11. Let's say you'd like to retire with, oh I don't know, \$1 million. Given the same account from #10, how much would you need to deposit every month for this to happen?

12. Maggie borrows \$7,000 from the bank at 8% interest compounded monthly.
    (a) If she makes a \$400 payment at the end of the first month, how much does she then owe?
    (b) If she continues to make \$400 payments every month, how long will it take for her to pay off the loan?

13. Andrew takes out an \$18,500 student loan to pay for graduate school. If the interest rate is 6.3% compounded quarterly, how large would his quarterly payments be in order to pay off this loan in 10 years?

14. Franny and Zooey are ready to buy their first house. They determine that they can pay \$1100 per month towards a mortgage. If the 20 year mortgage available to them charges 7.8% interest compounded monthly,
    (a) how large of a loan can they afford?
    (b) create an amortization schedule, showing their payments for the first 3 months of the loan.

15. When rolling two dice, what is the probability that you:
    (a) Roll a 5?
    (b) Roll a number higher than 9?
    (c) Don't roll a 3?
    (d) Roll a number that is at least 5?
    (e) Roll an even number or a number larger than 3?

16. According to the American Medical Association, in1996 there were 737,764 physicians in the United Sates, 157,387 of whom were female. There were 133,005 physicians under 35 years of age, 47,348 of whom were female. What is the probability that a randomly chosen physician in 1996 was female or under the age of 35?

17. A recent poll at a university shows that, in a vote for the new mascot: 60% of students would approve of a giraffe, 42% would approve of a hippo, and 17% would approve of both. If we select a student at random, what's the probability that he or she would approve of neither the giraffe nor the hippo?