Extra Credit:

1. Find all the zeros: $x^3 - 2ex^2 - 5e^2x + 6e^3 = 0$

2. Suppose you are offered a job that lasts one month, and you are to be very well paid. Which of the following methods of payment is more profitable for you? Show your work.
(a) One million dollars at the end of the month.
(b) Two cents on the first day of the month, 4 cents on the second day, 8 cents on the third day, and so on. There are 30 days in the month.

3. Congratulations! You have just won Readers Digest Sweepstakes and you are waiting patiently for Ed McMahon to show up on your doorstep and present the check. There is one thing you have to decide before he gets here. You can either take the $50,000 in one lump sum or receive two installments at $25,000 each. The best interest rate available for the 50 grand is 4.75% per year compounded monthly, while for the two installments, the rate on the first 25 grand will be 5% per year and on the second installment (to be received one year later) will be 5% per year compounded quarterly.
a) Find the amount of money in your $50,000 account after 10 years.
b) Find the amount of money in your two $25,000 accounts after 10 years.
c) What do you notice about the effect of compounding interest?

4. Late last night, as Agent 008 negotiated his way back to headquarters after a long day, he saw the strangest glowing light. It came closer and closer until finally he could see what was creating the light. It was some kind of spaceship! He was frozen in his tracks. It landed only 15 feet from him, and a hatch slowly opened. Four little creatures came out carrying all sorts of equipment; including calculators and what appeared to be laser beams. They did not seem to notice that Agent 008 was there; that is, until he sneezed! Suddenly, the creatures turned around, looking very startled. They dashed into the spaceship, closed the hatch, and rocketed into the night. Could he believe what he had seen? Was it just a dream? After a few minutes of standing there dazed and confused, he started walking on, his eyes glazed over. He was just coming to his senses when he stepped on something strange. He picked it up and to his surprise it was one of the creature's calculators! What a prize! He started playing with it as he walked on. Boy! Headquarters is going to love this! It appeared to have a log button and as he played with it he noticed something interesting: log 10 did not equal 1 as it did on his calculator. With this calculator, $\log 10 \approx 0.926628408$! He tried some more: $\log 100 \approx 1.853256816$ and $\log 1000 \approx 2.77988524$. This was most peculiar. Obviously, the creatures did not work in base 10!
a) What base do the space creatures work in? Explain how you got your answer. You may want to rewrite the problem as $\log_b 10 = 0.926628408$ and try to figure out the value of b.
b) How many fingers do you think these space creatures have?

5. A district's population continues to grow exponentially. In 2002, a school district's population was 28,000. It had grown to 38,094 by 2006.

   a) What is the district's yearly rate of growth?
   b) What will be the projected population in 2010?
   c) When will the population exceed 90,000?

6) The half-life of radioactive actinium (^{227}Ac) is 22 years. What percent of a present amount of radioactive actinium will remain after 11 years?