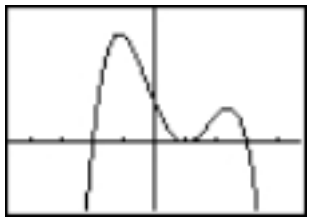
College Algebra **Review for Test #3**

Section #1: The following problems should be done without a graphing calculator.

1. The graph of a 4th degree polynomial function f is shown to the right. The graph passes through the point (-1 , 64).Write a rule for the function f. (You can leave your answer in factored form.)



2. Given $f(x) = 2x^3 + 3x^2 - 9x$.

   a. Algebraically, find the x-intercepts of the graph of f.

   b. Sketch the graph of f.

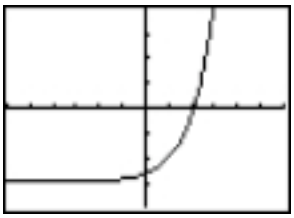
3. Simplify the following expressions

   a. $36^{-\frac{3}{2}}$ b. $\frac{6e^{-2}}{4e^3}$ c. $\frac{a^3}{a\sqrt{a}}$

4. Sketch the graph of the following functions. Show asymptotes with dotted lines. What is the y-intercept of each graph?

   a. $y = \left(\frac{2}{5}\right)^x - 3$ b. $y = -e^{x-1}$ c. $y = 3 \cdot 2^{-x} + 1$

5. Given the graph of f shown below, sketch the graph of f^{-1} , the inverse of f. (Note: f has a horizontal asymptote at y = -3.)



6. If $f(x) = \frac{2x-1}{x+1}$, find $f^{-1}(x)$, the inverse of f(x). Then verify your answer by showing that $f^{-1}(f(x)) = x$.

Section 2: You may use your graphing calculator for the following problems.

7. Look at the worksheet/assignment with the **Box With Top** and **Pizza Box** problems.

8. Solve the equation $4x^3 - 36x = 26x^2 + 21$.
   Hint: You need to use your calculator to find one solution. All solutions should be exact, not decimals.

9. An exponential function in the form $y = a \cdot b^x$ passes through the point (0 , 75) and (8 , 14). What is the equation of the function? (Round the value of b to 3 decimal places.)

Given: $A = P\left(1 + \frac{r}{n}\right)^{n \cdot t}$ and $A = Pe^{r \cdot t}$

10. Find the amount that results from each investment.
    a. \$2000 invested at 12% compounded monthly for $3\frac{1}{2}$ years.
    b. \$500 invested at 5.25% compounded continuously for 20 years.

11. Jerome will be buying a used car for \$12,000 in 3 years. How much money should he ask his parents for now so that, if he invests it at 5% compounded continuously, he will have enough to buy the car?

12. If Angela has \$900 to invest at 10% per year compounded quarterly, how long will it take for her investment to triple? If the compounding is continuous, how long will it be?
(Note: Write equations to solve these problems, but solve the equations graphically.)

13. At what interest rate (to the nearest 0.01%) compounded monthly must \$1000 be invested for 5 years so that the accumulated amount is \$1800? (Solve algebraically.)