1. Find the solutions to the equations or inequalities below. All solutions must be exact solutions. Do not give an approximate solution. If there are extraneous solutions, please state so.

   a. $3x^2 - 11x + 10 = 0$

   b. $3x^{2/3} - 11x^{1/3} + 10 = 0$

   c. $log_2(x - 1) + 3 = log_2(2x + 1)$

   d. $3^{4x-1} = 5^{2+7x}$

2. The number of bacteria in a certain population increases according to a continuous exponential growth model, with a growth rate parameter of 4.1% per hour. How many hours will it take for the sample to double?

3. The function below has at least one rational zero.
   $h(x) = 5x^4 - 29x^3 - 40x^2 - 13x - 7$ Use this fact to find all zeros of the function.
   a. Then write $h(x)$ as the product of irreducible factors.
   b. Then sketch the graph of the function. Make sure you show all the x-intercepts and y-intercepts
   c. Determine all the intervals where $h(x) < 0$.
   d. Find all solutions to $5x^4 - 29x^3 - 40x^2 - 13x - 7 = 0$
   e. Find all solutions to $5x^4 - 29x^3 - 40x^2 - 13x - 7 > 0$

4. Caitlin invested $3200 at 4.2% interest compounded quarterly. How many years will she will have to wait for double her money?

5. Solve the system of equations and inequalities below.

    a. $\begin{cases} 3x + 5y \leq 1 \\ x - 5y > 7 \end{cases}$ (HINT: Graph the lines and shade the region that represents the solutions)

    b. $\begin{cases} 3x^2 + y^2 = 6 \\ 2x^2 - 3y^2 = -7 \end{cases}$

6. Create a system of equations that has the solutions $(2,1), (2,-1), (-2,1), (-2,-1)$.