Math 104 90A[1] October 4th, 1999. Worksheet 6

*http://www.math.ubc.ca/~ athreya/104*

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1. *Review of Exponents* Do not use a calculator.
   (a) Find $a$ if $10^6 10^7 = 10^a$.
   (b) Find $b$ if $\frac{6^3}{6^5} = 6^b$.
   (c) Find $m_1$ and $m_2$ if $\left(\frac{2}{5}\right)^n = \frac{2^{m_1}}{5^{m_2}}$.
   (d) Find $c$ if $(1.0356423)^0 = c$.
   (e) Find $d$ if $4^d = \frac{1}{16}$.
   (f) Find $c_1$ and $c_2$ if $(4 \cdot 3)^6 = 4^{c_1} 6^{c_2}$.

2. Graph the following functions:
   (a) $f(x) = 2^x$
   (b) $f(x) = 1$
   (c) $f(x) = (\frac{1}{2})^x$

3. If $1000 = P(1.05)^3$ find $P$.

4. Let $r = .05, P = 3000, n = 4$. Find $S$ if
   (a) $S = P(1 + r)^n$
   (b) $S = Pe^{rn}$

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[1] **Office hours:** Monday: 1:45-3:15pm, Tuesday:3:30-5:30pm, Wednesday 2:15-3:15pm

5. Dilbert gets his retiring bonus of \$600 under the "..did at least 2hours and at most 3hours of work in the last 25 years.."clause of his contract. He invests in the newly opened mutual-fund for lazy retired employees that guarantees an annual rate of interest of 8% compounded quarterly.

   (a) What will the amount be after 21 years ?

   (b) If Dilbert gets out of the mutual-fund in one year, how much will he have ? What is the effective rate of interest ?

   (c) Dilbert wants \$2000 after 25 years. How much should he invest in the mutual fund ?

6. Your parents inform you that your great-great-grand mother Christine, the financier, has left you a legacy. However, she has laid out three options under which you may receive your money, and you must now choose which one you want.

   (a) A CIBC bank account is opened in your name. It bears no interest. $\$1,000$ is deposited in the account at the beginning of each of the next 25 years. After the 25th deposit you are given the balance.

   (b) An Toronto-dominion bank account set up in your name. and $\$10,000$ is deposited in it at the beginning of a 25 year period. At the beginning of each new year 15% of the current balance of the account is credited to the account. You are given the balance at the end of the 25th year,

   (c) This option is the same as the previous one (TD-bank) with two changes, the account is in Bank of Montreal and your account has an 10% annual rate of interest but is compounded semi-annually.

   Assuming the value of the Canadian dollar stays the same which option gets you the most amount of money !