1. Solve: a) $\log_3 x + \log_3(x-2) = 1$ b) $\log_2(2x+4) - \log_2(x-1) = \log_2 8$

   c) $(\ln x)^2 - \ln x^5 = 14$ d) $\log_x 27 = \log_{12} 3$

2. Solve: a) $6^{x-1} = 3^{2x+1}$ b) $3(2)^x = 12^{x-1}$

3. How many times as intense as the 2010 Haiti earthquake (7.0) was the 2011 Japan earthquake (8.9)?

4. Jim invested $3500 in a savings account at an interest rate of 5.4% per year compounded monthly. Betty invested $3000 in a GIC at an interest rate of 6.8% per year compounded annually. After how many years will the two investments be equal in value?

5. Alex decided to go on a trip that will cost him $3000. He can afford to invest $100 a month that will pay him 4% annual interest rate compounded monthly. How many months does it take to save to $3000?

6. An x-ray beam of intensity, I_0, in passing through absorbing material x mm thick merges with an intensity, I, given by $I = I_0 e^{-kx}$. When the material is 9 mm thick, 50% of the intensity is lost.

a) Calculate the value of the constant k to three decimal places.

b) What percentage intensity, to one decimal place, remains if the material is 20 mm thick?

Ans:

1a) $x = 3$ b) $x = 2$ c) $x = e^7, e^{-2}$ d) 1728

2a) $x = -7.13$ b) $x = 2$

3. 79.4

4. 12.94 years

5. 28.64, 29 months

6. a) 0.077 b) 21.4%