- 1. Solve for the given unknown, round to two decimal places where appropriate: (6 marks)
- $5^{x} = 100$ (a)

 $1000 = 2^z$

 $2^{2x+5} = 1$

- 2. Solve the following logarithms (10 marks)
- $\log_2 64 = x$ (a)

(b) $\log_5 125 = x$

 $\log_2 100 = x$ (c)

(d) $\log_{x} 121 = 2$

 $\log_3 81 + \log_2 16 = x$ (c)

(d) $\log_2 \sqrt{16} - \log_5 \sqrt[3]{5} = x$

- 3. Solve for the given unknown: (5 marks)
- $2(3^{x+2}) = 54$ (a)

(b) $-3(5^{x+3}) + 86 = 50$

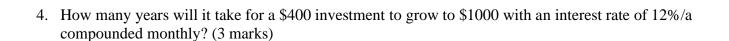
Formula

$$A_f = A_i(1+i)^n \qquad \qquad A_f = A_i(\frac{1}{2})^n$$

$$A_f = A_i (\frac{1}{2})^n$$

$$\log_a m + \log_a n = \log_a mn \qquad \qquad \log_a m - \log_a n = \log_a (\frac{m}{n}) \qquad \qquad \log_a m^n = n \log_a m \qquad \qquad \log_a \sqrt[n]{m} = \frac{1}{n} \log_a m$$

$$\log_a m^n = n \log_a m$$



5. A radioactive isotope has a half-life of 432 years, determine how long it takes for a sample to degrade to 34% of its original mass. (3 marks)

6. Solve for x: (3 marks) - Challenge Problem (you have to dig deep for this one) $5^{2x} - 4(5^x) = 12$.

$$A_f = A_i (1+i)^n$$

$$A_f = A_i (1+i)^n \qquad \qquad A_f = A_i (\frac{1}{2})^n$$

$$\log_a m + \log_a n = \log_a mn$$

$$\log_a m + \log_a n = \log_a mn \qquad \qquad \log_a m - \log_a n = \log_a (\frac{m}{n}) \qquad \qquad \log_a m^n = n \log_a m \qquad \qquad \log_a \sqrt[n]{m} = \frac{1}{n} \log_a m$$

$$\log_a m^n = n \log_a m$$

$$\log_a \sqrt[n]{m} = \frac{1}{n} \log_a m$$