

## Topic 1. Number and Algebra (MATH AI SL)

- 1) The product of  $8 \times 10^8$  and  $9 \times 10^{12}$  must be written as \_\_\_\_\_. And the quotient of  $8 \times 10^{-12}$  and  $2 \times 10^{-15}$  must be written as \_\_\_\_\_.

- 2) The expression below means to \_\_\_\_\_ the \_\_\_\_\_ sequence from \_\_\_\_\_ to \_\_\_\_\_.

$$\sum_{x=4}^{100} 2 \times 3^x$$

In this example, the common \_\_\_\_\_ is \_\_\_\_\_.

- 3) Simple interest is calculated by multiplying \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_. It forms an \_\_\_\_\_ sequence because the \_\_\_\_\_ amount gets \_\_\_\_\_ every year.
- 4) The common difference is calculated by \_\_\_\_\_  $U_1$  from  $U_2$ . An approximate could be found by finding the \_\_\_\_\_ of several differences.
- 5) The common ratio is calculated by \_\_\_\_\_  $U_2$  by  $U_1$ . An approximate could be found by \_\_\_\_\_ the ratios or by making an \_\_\_\_\_ model.
- 6) To get the **real** interest rate, one should subtract the \_\_\_\_\_ rate from the \_\_\_\_\_ rate.
- 7) For depreciation, it is important to use a \_\_\_\_\_ multiplier. For example, a 20% decrease becomes \_\_\_\_\_.
- 8) You should understand indices. For example,  $(x^2)^{-4}$  can be written as \_\_\_\_\_. This is useful for calculus.
- 9) You must understand logarithms and how to change them to \_\_\_\_\_ form and vice versa. For example,  $\log x = 2$  can be written as \_\_\_\_\_ and  $e^x = 5$  can be written as \_\_\_\_\_.

10) If a number has been rounded to one d.p. and the solution is  $x = 5.4$ , you must know that the lower bound is \_\_\_\_\_ and the upper bound is \_\_\_\_\_. This can be written an inequality like this \_\_\_\_\_.

11) When using TVM solver for financial applications, it is important to understand that payments, if present, must always take place at the \_\_\_\_\_ of the year. Also, payments must be entered with a \_\_\_\_\_ sign. If applicable to your calculator, it is important to note that either the \_\_\_\_\_ or \_\_\_\_\_ need to be \_\_\_\_\_ but not both. \_\_\_\_\_ is the number of \_\_\_\_\_, not necessarily the number of \_\_\_\_\_.

12) You must know how to solve systems of three equations. This is one way of forming a quadratic model. An example is solving for  $x$ ,  $y$  and  $z$  in the following system:

$$\begin{cases} 2x + 4y + z = 8 \\ 5x + 2y - 4z = 10 \\ 3x - 8y - 2z = 12 \end{cases}$$

Solve this one and write solutions below: