

1. Write an m file to determine the sum of the infinite series  $\sum_{n=1}^{\infty} \frac{1}{n^2}$  converges to  $\pi^2 / 6$ . Do this by computing the sum for a)  $n=100$ , b)  $n=1000$  and c)  $n=10000$ . Do this by assigning  $n$  values using `logspace` command.

2. Write an m-file to evaluate the following algebraic formula

$$p(t) = \begin{cases} \log(t^2 - a) & \text{if } t^2 > a \\ \log(t^2) & \text{if } t^2 \leq a \end{cases}$$

where  $t$  is a number that a user enters and  $a = 100$ .

3. A problem in timber growth management is to determine how much of an area to leave uncut so that the harvested area is reforested in a certain period of time. It is assumed that reforestation takes place at a known rate per year, depending on climate and soil conditions. A reforestation equation expresses this growth as a function of the amount of timber standing and the reforestation rate. For example, if 100 acres are left standing and the reforestation rate is 0.05, then  $100(1+0.05)$  are forested at the end of the first year. At the end of the second year, the number of acres forested is  $105(1+0.05) = 110.25$  acres. Assume that there are 14,000 acres total with 2500 acres uncut and that the reforestation rate is 0.02. Write a program to calculate and print a table showing the number of acres forested at the end of each year, for up to 20 years.