

#1. Solution:

We can find  $r_k$  using the formula  $p = 100 e^{-kr_k}$  and so

$$r_k = \frac{52}{M} \ln\left(\frac{100}{p}\right)$$

\* For 13-week T-bill :  $M = 13$  and  $p = 99.7$ . Therefore

$$r_k = 4 \ln\left(\frac{100}{99.7}\right) = 0.012 \Rightarrow r_k = 1.2\%$$

\*\* For 26-week T-bill :  $M = 26$  and  $p = 99.4$ , and so

$$r_k = 2 \ln\left(\frac{100}{99.4}\right) = 0.012 \text{ or } r_k = 1.2\%$$

\*\*\* For 52-week T-bill we have  $M = 52$  and  $p = 99$  and

so

$$r_k = \ln\left(\frac{100}{99}\right) = 0.01 \Rightarrow r_k = 1\%$$

New spot rates for the next week can be calculated in the same way and we get

\* For 13-week T-bill,  $r_k = 0.0128 = 1.28\%$

\*\* For 26-week T-bill,  $r_k = 0.0122 = 1.22\%$

\*\*\* For 52-week T-bill,  $r_k = 0.0103 = 1.03\%$