1.

\[ PV_1 = \sum_{n=h}^{n=h+k} A e^{-nr} = A e^{-hr} \sum_{n=0}^{n=k} e^{-nr}. \]

In the sum we have a geometric series with gradient:

\[ e^{-r} \]

Therefore we can use the following formula (when \( x \neq 1 \)):

\[ \sum_{n=q}^{n=p} x^n = x^h \frac{1 - x^{q-p+1}}{1 - x} \]

Hence:

\[ PV_1 = A e^{-hr} \frac{1 - e^{-r(k+1)}}{1 - e^{-r}}. \]

\[ PV_1 = $25,399 \]

2.

\[ PV_2 = \sum_{n=h}^{n=h+k} A e^{g(n-h)} e^{-nr} = A e^{-gh} \sum_{n=h}^{n=h+k} e^{(g-r)n} \]

\[ PV_2 = A e^{-gh} \frac{1 - e^{-(g-r)(k+1)}}{1 - e^{-r}} \text{ if } g \neq r \]

\[ PV_2 = A e^{-gh} (k + 1) \text{ if } g = r \]

\[ PV_2 = $28,466 \]

3. We have the following:

\[ PV_3 = \int_{t_0}^{t_1} F_t \, dt = \int_{t_0}^{t_1} A e^{g(t-t_0)} e^{-rt} \, dt \]

\[ PV_3 = A e^{-gt_0} \int_{t_0}^{t_1} e^{(g-r)t} \, dt \]

\[ PV_3 = A e^{-gt_0} \frac{e^{(g-r)t_1} - e^{(g-r)t_0}}{g-r} \text{ if } g \neq r \]

\[ PV_3 = A e^{-gt_0} (t_1 - t_0) \text{ if } g = r \]

Here we have \( t_0 = h \) and \( t_1 = h + k + 1 \), therefore:

\[ PV_3 = A e^{-rh} \frac{e^{(g-r)(k+1)} - 1}{g-r}. \]

\[ PV_3 = $28,183 \]

4. Let \( f \) be the average inflation over two years. Then:

\[ (1 + f)^2 = (1 + f_1)(1 + f_2) \]

\[ f = (1 + f_1)^{1/2}(1 + f_2)^{1/2} - 1 \]

\[ f = -0.5\% \]
5. Let $f$ be the inflation for the entire year, then:

$$(1 + f) = (1 + f_1)(1 + f_2)(1 + f_3)(1 + f_4)$$

$$f = (1 + f_1)(1 + f_2)(1 + f_3)(1 + f_4) - 1$$

$f = 2.01\%$

6. For one month, the real interest rate is given by:

$$i' = \frac{r - f}{1 + f}.$$ 

$i' = 0.4975\%$ Therefore the effective real interest rate per year is:

$$i'_a = (1 + i')^{12} - 1.$$

$$i'_a = 6.14\%.$$