

**Exercise 5.4**

We simply apply recursion formulas. Starting with  $a_{60} = vp_{60}(1 + a_{61})$ , we get

$$vp_{60} = \frac{a_{60}}{1 + a_{61}} = \frac{10.996}{11.756}.$$

Extending the recursion to two years, we have  $a_{60} = vp_{60} + v^2 {}_2p_{60}(1 + a_{62})$  so that

$${}_2p_{60} = \frac{a_{60} - vp_{60}}{v^2(1 + a_{62})} = \frac{10.996 - (10.996/11.756)}{(1.06)^{-2}(11.509)} = 0.9822004.$$