

Name (print neatly):

KEY

Score: _____ /20

Quiz 9: Thursday, April 2, 2015

To receive full credit, show all work necessary to justify answers and all steps of proofs and derivations clearly, in logical sequence, using notation developed in class. Partial credit will be given only for significant progress toward a solution.

1. Angela receives an annuity that will pay \$500 on May 1, 2015 and has annual payments through May 1, 2039 (a total of 25 payments). The payments increase by \$500 each year. As soon as Angela receives a payment, she deposits it in a savings account with a 3% effective annual rate of interest. No withdrawals or additional deposits are made.

(a) Express the balance in Angela's account on May 1, 2040 in terms of actuarial symbols.

$$500 (I\ddot{S})_{\overline{25}|} = 500 (IS)_{\overline{25}|} (1.03)$$

(b) Compute the balance in Angela's account on May 1, 2040 to the nearest cent.



$$500 (I\ddot{S})_{\overline{25}|} = 500 \left[\frac{\ddot{S}_{\overline{25}|} - 25}{d} \right]$$

$$= 500 \left[\frac{\frac{1.03^{25} - 1}{\frac{0.03}{1.03}} - 25}{\frac{0.03}{1.03}} \right]$$

$$\approx \underline{\underline{\$ 215,493.89}}$$

$$(I\ddot{S})_{\overline{n}|} = \frac{\ddot{S}_{\overline{n}|} - n}{d}$$

$$\ddot{S}_{\overline{n}|} = \frac{(1+i)^n - 1}{d}$$

$$d = \frac{i}{1+i}$$