

Name (print neatly): KEY Score: /20

Quiz 5: Thursday, February 19, 2015

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

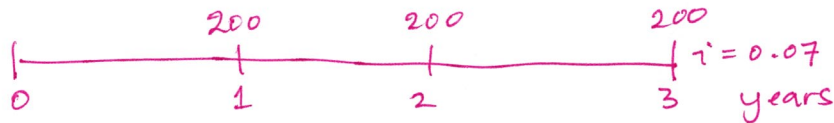
1. (6 pts) Define each of the following.

(a) annuity *An annuity is a series of payments made at equal intervals of time.*

(b) annuity-immediate *An annuity-immediate is an annuity where the payments are made at the end of each period.*

2. (14 pts) Consider a 3-year annuity paying \$200 at the end of each year. Assume an effective rate of interest of 7% per annum.

(a) Sketch a time line, labeling the payments.



(b) Find the present value (at $t = 0$) of this annuity. You may use any method/formula, as long as you show your reasoning clearly.

$$PV = 200 a_{\overline{3}|0.07}$$

$$= 200v + 200v^2 + 200v^3$$

$$= 200(1.07)^{-1} + 200(1.07)^{-2} + 200(1.07)^{-3}$$

$$\approx \$524.86$$

$$PV = 200 a_{\overline{3}|0.07}$$

$$= 200 \left[\frac{1-v^3}{i} \right]$$

$$= \frac{200(1-1.07^{-3})}{0.07}$$

$$\approx \$524.86$$

(c) Find the accumulated value (at $t = 3$) of this annuity. You may use any method/formula, as long as you show your reasoning clearly.

$$AV = 200 s_{\overline{3}|0.07}$$

$$= 200 + 200(1.07) + 200(1.07)^2$$

$$\approx \$642.98$$

$$AV = 200 s_{\overline{3}|0.07}$$

$$= 200 \left[\frac{(1+i)^3 - 1}{i} \right]$$

$$= \frac{200(1.07^3 - 1)}{0.07}$$

$$\approx \$642.98$$