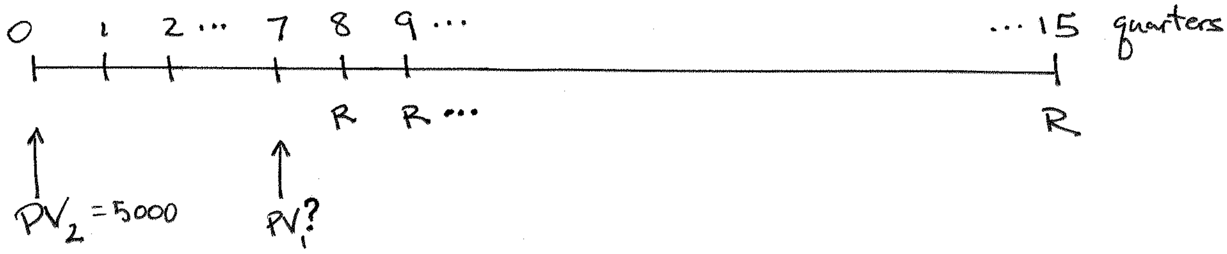
Annuity Summary

1.



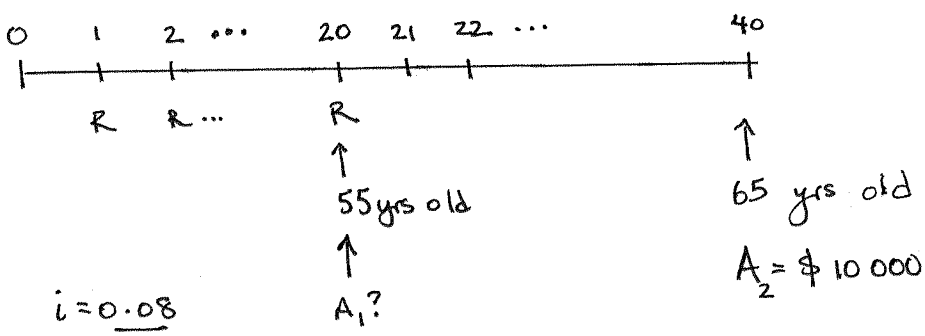
$i = \frac{0.048}{4}$ $\quad n_1 = 8$

i) $PV_1 = \dfrac{R\left[1 - \left(1 + \frac{0.048}{4}\right)^{-8}\right]}{\left(\frac{0.048}{4}\right)}$

ii) $PV_2 = \overbrace{\dfrac{R\left[1 - (1.012^{-8})\right]}{0.012}}^{PV_1}(1.012^{-7}) = 5000$

$R \doteq 716.6279$

2.



$i = \frac{0.08}{2}$

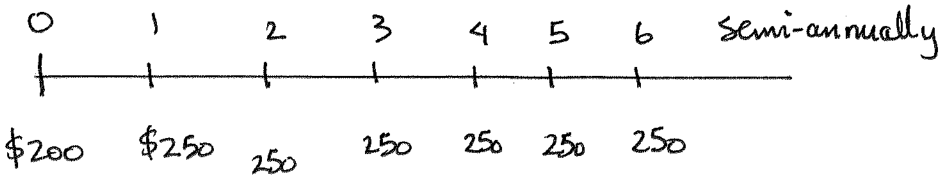
i) $A_1 = \dfrac{R\left[(1.04)^{20} - 1\right]}{0.04}$

ii) $A_2 = A_1(1.04)^{20} = 10000$

$R = \dfrac{10\,000}{(1.04)^{20}} \cdot \dfrac{(0.04)}{\left[(1.04)^{20} - 1\right]}$

$R \doteq 153.2627$

3.



$i = \frac{0.09}{12}$ monthly

i: interest comp. semi-annually

convert int:

$$\left(1 + \frac{0.09}{12}\right)^{12} = (1+i)^2$$

"monthly vs semi" in one year

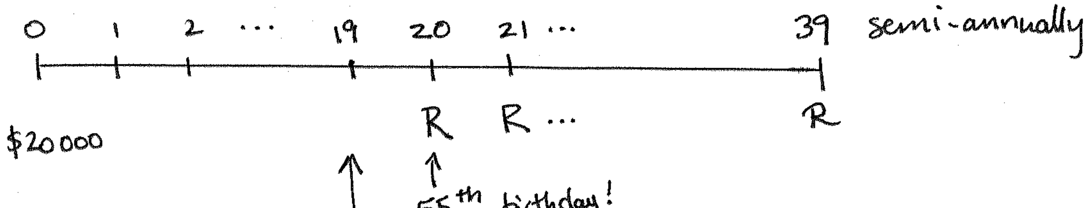
$$\therefore i = (1.0075)^6 - 1$$

$$PV = 250\left[\frac{1-(1+i)^{-6}}{i}\right] + 200$$

↑ downpayment

$$\doteq 1485.9299$$

4.



$i = \frac{0.049}{2}$

$$A = 20\,000(1+i)^{19}$$

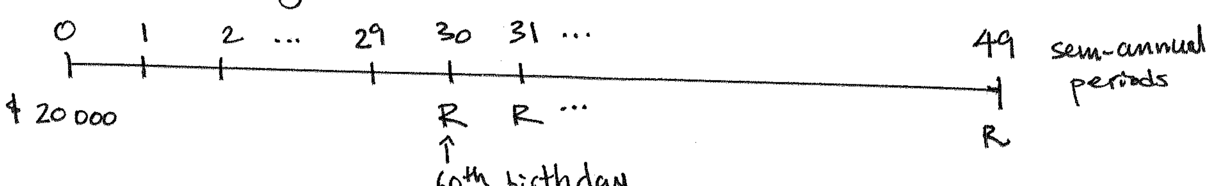
$$PV = R\left[\frac{1-(1+i)^{-20}}{i}\right]$$

$$A = PV$$

$$\therefore R = \frac{20000(1+i)^{19} \cdot i}{\left[1-(1+i)^{-20}\right]}$$

$$R \doteq 2022.4654$$

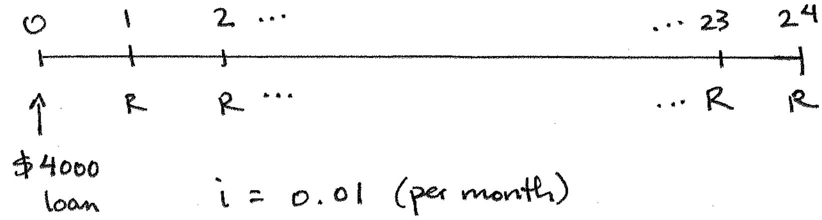
4b) wait until 65yrs old?



ans. $R \doteq \$\,2576.3255$

Mr. Jay

5. a)



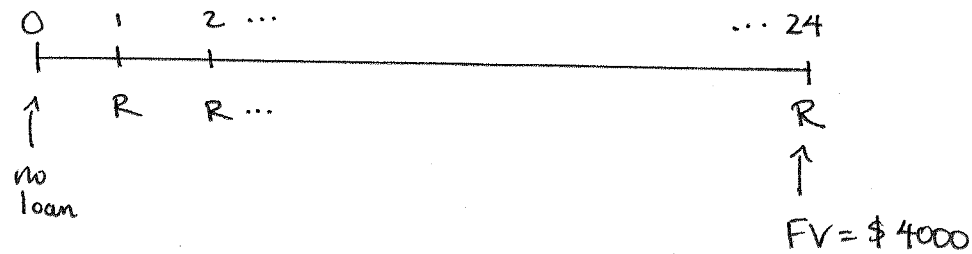
$i = 0.01$ (per month)

$$PV = 4000 = R\left[\frac{1-(1.01)^{-24}}{0.01}\right]$$

$$R \doteq 188.2939$$

Mr. Cue

b)



$$4000 = R\left[\frac{(1.01)^{24}-1}{0.01}\right]$$

$$R \doteq 148.2939$$

c) sum of pmts,

Mr. Jay : $188.29 (24) = $4518.96

Mr. Cue : $148.29 (24) = $3558.96

6.

quarters (3 years; 36 months)

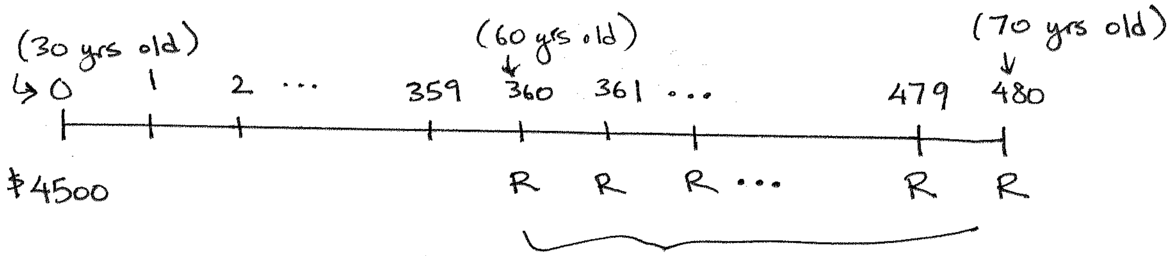
interest conversion: $\left(1+\frac{0.042}{12}\right)^{12} = (1+i)^4$ "monthly vs. quarterly"

$$i = (1.0035)^3 - 1 \quad \text{(comp. quarterly)}$$

$$A = 500\left[\frac{(1+i)^{12}-1}{i}\right]$$

$$\doteq 6360.2213$$

7.



$i = \frac{0.054}{12}$ monthly

* 121 pmts (!)

$$4500(1+i)^{359} = R\left[\frac{1-(1+i)^{-121}}{i}\right]$$

$$R \doteq 242.1447$$

8. interest conversion: $\left(1+\frac{0.1}{4}\right)^4 = (1+i)^1$ "quarterly vs. annually"

$$i = 1.025^4 - 1$$

$$A = 1500\left[\frac{(1+i)^{10}-1}{i}\right]$$

$$\doteq 24\ 345.6098$$

9.

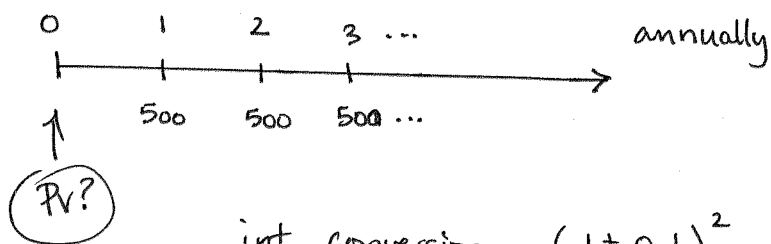
interest conversion: $\left(1+\frac{0.033}{12}\right)^{12} = (1+i)^2$ "monthly vs. semi-ann."

$$i = 1.00275^6 - 1$$

$$PV = 450\left[\frac{1-(1+i)^{-16}}{i}\right]$$

$$\doteq 6277.0904$$

10.



int. conversion: $\left(1+\frac{0.1}{2}\right)^2 = (1+i)^1$ "semi. vs. annually"

$$i = 0.1025$$

$$PV = 500(1+i)^{-1} + 500(1+i)^{-2} + 500(1+i)^{-3} + \ldots$$ (∞ Geo. Series!) $S_\infty = \frac{a}{1-r}, |r|<1$

$$= \frac{500(1+i)^{-1}}{1-(1+i)^{-1}}$$

$$\doteq 4878.0488$$