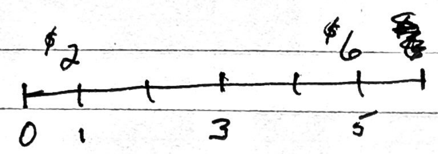
Part A:

1. $a_{\overline{10}|.05} = \frac{1-v^{10}}{i} = 7.722$

$a_{\overline{10}|.05}$ is the present value of 10 payments of $1 discounted at interest rate i.

2.



Value at time 3 is $2(1+i)^2 + 6v^2$.

Cannot evaluate without knowing the value of i.

3. $10\, a_{\overline{20}|.05} + v^{20}\, 10\, a_{\overline{20}|.05}$

$a_{\overline{20}|.05} = \frac{1-v^{20}}{i} = \frac{1-.3769}{.05} = 12.46622.$

Answer: $124.622 + v^{20}(124.622)$ $\qquad v^{20} = .3769$

$= 171.604.$

The expression represents the present value of an annuity of 10, discounted at 5%, with payments for 40 years.

4. $P = \frac{42{,}000}{a_{\overline{60}|.01}} = \$934.27$

P could be the monthly payment on a $42,000, 5 year loan at 12% APR.

Part B.

1. $\$250{,}000 = P \cdot a_{\overline{240}|.005}$ $\qquad a_{\overline{240}|.005} = 139.58$

$$P = \frac{250{,}000}{139.58} = 1791.08$$

2. Badly Formed Question. My apology for not specifying the term of the loan.

No Answer

3. First, find the Monthly mortgage payment.

$$P\, a_{\overline{240}|.00333} = 200{,}000 \Rightarrow P = \frac{200{,}000}{a_{\overline{240}|.00333}}$$

or $$P = \frac{200{,}000}{165.08} = 1211.54$$

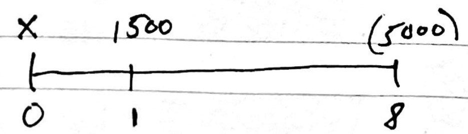
Now, Find the remaining unpaid balance of the mortgage.

$$\text{Unpaid Balance} = P \cdot a_{\overline{180}|.00333}$$

[Note: There are 180 months to go in the mortgage.]

$$= (1211.54)(135.229)$$

$$= \$163{,}835.09$$

4. 

$i = 6\%$

$$X \cdot (1+.06)^8 + 1500\,(1+.06)^7 = 5000$$
$$X\,(1.59385) \qquad 1500\,(1.5036)$$
$$X\,(1.59385) + 2255.44 = 5000 \Rightarrow X = \$1721.97$$