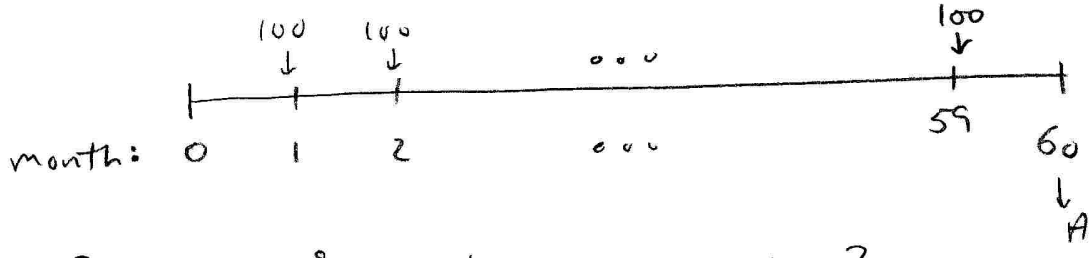
Some useful formulas:

$$A = P\left[\frac{(1+i)^m - 1}{i}\right] \qquad V = P\left[\frac{1-(1+i)^{-m}}{i}\right]$$

(1) [3] Determine the amount of the annuity after 60 monthly deposits of \$100 if interest is 4% compounded monthly. (Round your answer to two decimal places.)



$P = 100$, $i = \frac{0.04}{12}$, $m = 60$, $A = ?$

$$\therefore A = P\left(\frac{(1+i)^m - 1}{i}\right) = 100\left[\frac{\left(1+\frac{0.04}{12}\right)^{60} - 1}{\left(\frac{0.04}{12}\right)}\right] \doteq \$6629.90$$

(2) [5] A person has a goal of saving \$400,000 over the next 35 years. Equal deposits will be made at the end of each month into a retirement savings fund paying interest at 6% compounded monthly. How large must the monthly deposits be to reach the goal? (Round your answer to two decimal places.)

$(35)(12) = 420$

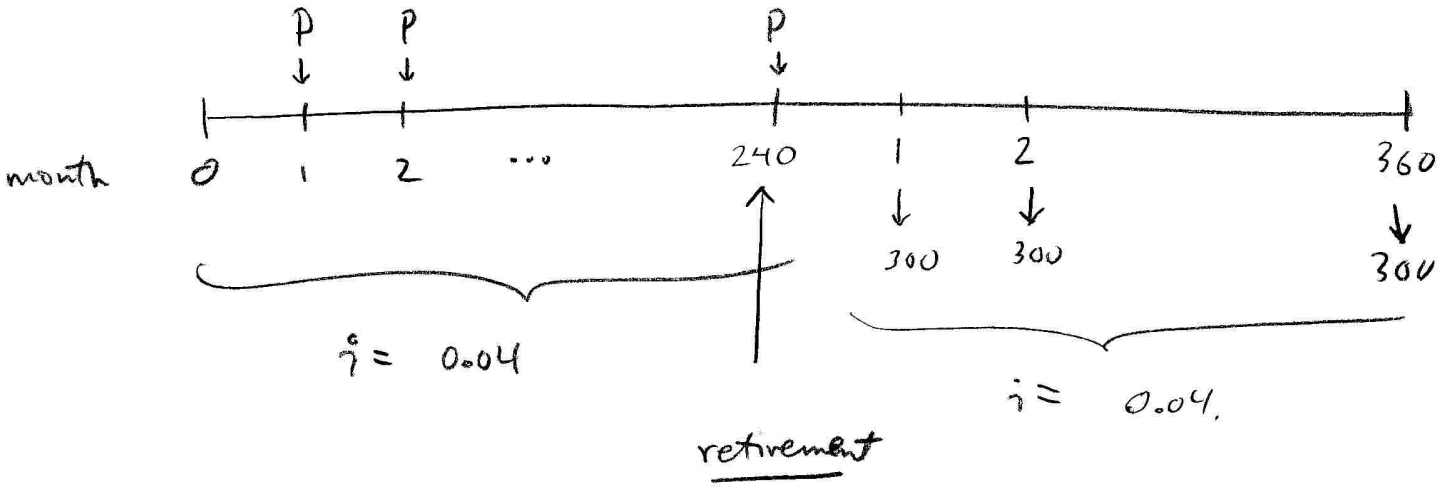
$A = 400\,000$

$i = \frac{0.06}{12} = 0.005$

$P = ?$

$$P = \frac{iA}{(1+i)^m - 1} = \frac{(0.005)(400{,}000)}{(1.005)^{420} - 1} \doteq \$280.76$$

(3) [7] John is 45 years old and wants to retire at 65. He plans to make monthly deposits in an account paying 4% compounded monthly so that when he retires he can withdraw \$300 a month for 30 years. (All deposits and payments are made at month-end.) How much should John deposit each month?



At Retirement: Need present value of \$300 payable at end of each month for $(30)(12) = 360$ months:

$P = 300$, $i = \frac{0.04}{12}$, $m = 360$.

$$\therefore A = 300\left[\frac{\left(1+\frac{0.04}{12}\right)^{360}-1}{\left(\frac{0.04}{12}\right)}\right] = \$208,214.82$$

Now, using $A = \$208,214.82$ at end of $m = 240$ months, determine P:

$$P = \frac{iA}{(1+i)^m - 1} = \frac{\left(\frac{0.04}{12}\right)(208,214.82)}{\left(1+\frac{0.04}{12}\right)^{240}-1} = \boxed{\$567.69}$$