3.4 #31 Cost of computer is $2500. Agree to repay it in 48 equal installments at 1.25% interest per month on the unpaid balance. How much are the monthly payments?

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

$i = \frac{r}{m} = 0.0125$

$m = 12$

$$2500 = PMT\left[\frac{1-(1+0.0125)^{-48}}{0.0125}\right]$$

3.4 #34 Annual interest rate is 24.99%. Monthly payments of $100. How long to pay off a balance of $2487.56?

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

$PV = \$2487.56$

$PMT = \$100$

$i = \frac{r}{m} = \frac{0.2499}{12}$

$n = ?$

$$\$2485.56 = \$100\left[\frac{1-\left(1+\frac{0.2499}{12}\right)^{-n}}{\frac{0.2499}{12}}\right]$$

$$\frac{\$2485.56}{100} = \left[\frac{1-\left(1+\frac{0.2499}{12}\right)^{-n}}{\frac{0.2499}{12}}\right]$$

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$$24.8556\left(\frac{0.2499}{12}\right) = 1-\left(1+\frac{0.2499}{12}\right)^{-n}$$

$$0.51762 = 1-\left(1+\frac{0.2499}{12}\right)^{-n}$$

$$-0.48238 = -\left(1+\frac{0.2499}{12}\right)^{-n}$$

$$0.48238 = \left(1+\frac{0.2499}{12}\right)^{-n}$$ [Divide by -1]

$$\ln(0.48238) = \ln\left(1+\frac{0.2499}{12}\right)^{-n}$$

Recall: $\log_a(x^n) = n\log_a(x)$

$$\ln(0.48238) = -n\cdot\ln\left(1+\frac{0.2499}{12}\right)$$

$$\frac{\ln(0.48238)}{-\ln\left(1+\frac{0.2499}{12}\right)} = n$$

$n \approx 35.37$ compounding periods (months)

So, it will take 36 months to pay off.