1. (4 pts) Find the annual percentage yield (APY) if a bank offers an APR of 4.25% compounded quarterly.

\[
APY = \left(1 + \frac{APR}{n}\right)^n - 1 = \left(1 + \frac{0.0425}{4}\right)^4 - 1 = 0.0432 = 4.32\%.
\]

2. (4 pts) How much money will you have after 40 years if you deposit $5,000 in an account with an annual interest rate of 5%, assuming that you earn simple interest?

\[
A = P + APR \cdot P \cdot Y = 5,000 + 0.05 \cdot 5,000 \cdot 40 = 15,000.
\]

3. (4 pts) How much money will you have after 30 years if you deposit $10,000 today at an APR of 4.5% compounded monthly?

\[
A = P \cdot \left(1 + \frac{APR}{n}\right)^nY = 10,000 \cdot \left(1 + \frac{0.045}{12}\right)^{12 \cdot 30} = 38,477.
\]

4. Suppose you want to have $200,000 in 40 years. Your bank offers an APR of 4%.

(a) (4 pts) What should your monthly deposits be in order to achieve this goal?

\[
A = PMT \cdot \left(\frac{1 + \frac{APR}{n}}{\frac{APR}{n}}\right)^{nY} - 1
\]

\[
$200,000 = PMT \cdot \left(1 + \frac{0.04}{12}\right)^{12 \cdot 40} - 1
\]

\[
$200,000 = PMT \cdot 1,181.96
\]

\[
PMT = \frac{$200,000}{1,181.96} = $169.21
\]

(b) (Extra Credit: 2 pts) How much did you earn in interest?

\[
$200,000 - $169.21 \cdot 12 \cdot 40 = $118,779.20.
\]