1. Dorcas wants to invest $5000 at 6.75% annual interest (compounded quarterly) for 8 years. How much will be in her account at the end of the 8 years? How much of this total is interest that she has earned? (Note that you should have two answers.)

In eight years, interest will have accrued $8 \times 4 = 32$ times, each time giving $\frac{1}{4} \times 6.75\%$. The principal amount is $5000$, so Dorcas will have

$$(1 + \left(\frac{6.75}{400}\right))^{32} \times 5000 = 8541.46$$

(rounded off to two decimal places) dollars. The portion of this total which is interest earned is anything over the principal amount, i.e., $8541.46 - 5000 = 3541.46$.

2. Calculate the monthly payment required to pay off a loan of $20,000 with an annual interest rate of 5.35% (compounded monthly) over 5 years.

Hint: $M = \frac{P \left(\frac{i}{12}\right)(1 + \frac{i}{12})^N}{(1 + \frac{i}{12})^N - 1}$

This is simply a matter of plugging the correct numbers into this formula. Here $i$ is the interest rate converted to decimals: $i = \frac{5.35}{100} = 0.0535$. $N$ is the number of months: $N = 5 \times 12 = 60$. The principal $P = 20,000$. Plugging these values into the formula, you get

$$M = \frac{20000(0.0535/12)(1 + (0.0535/12))^{60}}{(1 + (0.0535/12))^{60} - 1} = 380.64$$

(again rounded off to two decimal places).