1. A loan of 300 at an interest of 8% convertible semi-annually is to be repaid in 20 semi-annual installments. The repayments are to be of amounts $14, 14 + X, 14 + 2X, \ldots, 14 + 19X$. Find $X$, and find the interest and principal portions of the 13th repayment.

2. A loan of 500 is to be repaid in 15 years’ time from a sinking fund. Interest is paid annually on the loan at a rate of 10% per annum effective, while annual payments of $X$ are to be made into the sinking fund, which accumulates at a rate of 5% per annum effective. Immediately after the interest and sinking fund payments after 10 years, the lender offers the option of repaying the outstanding loan at once. How much extra money must the borrower find, in addition to what she has in the sinking fund at that time, to take up this option?