

**Seminar 27**

1. Given a principal  $P$  of \$1000 at 6 percent interest  $i$  for 3 years, find the future value  $S$  when the principal is compounded (a) annually, (b) semiannually, and (c) quarterly.
2. Find the effective annual interest rate on \$100 at 6 percent compounded semiannually.
3. Calculate the rate of effective annual interest on \$1000 at 12 percent compounded quarterly.
4. Find the present value of \$750 to be paid 4 years from now when the prevailing interest rate is 10 percent if interest is compounded (a) annually and (b) semiannually.
5. How much should a firm be willing to pay for a machine that will provide net savings of \$600 a year for 8 years, with no scrap value, when the discount rate is 12 percent?
6. How much should you be willing to pay for a government bond that promises to pay an annual dividend of \$2000 forever if an appropriate minimum required rate of return is 10%?
7. A mortgage of \$40,000 is to be repaid by 80 equal quarterly instalments (in arrears) of \$X. Interest of 4% is charged each quarter on the remaining part of the debt,

(a) Show mathematically that after six months the amount owed is :

$$$(40,000R^2 - RX - X)$$

where  $R = 1.04$ .

- (b) Find \$X, stating why your answer is reasonable.
- (c) Without carrying out any calculations, briefly explain why the repayments on a mortgage of \$80,000 would or would not be \$2X.



( c ) If P is doubled from \$40,000 to \$80,000, the factor 0.0418141 would be unaltered, and so the repayment figure would double to 2X.