

Section 8.3 Payments and Total Interest

- Determine the value of PV, i , and n in each situation.
 - a \$30 000 business loan is to be repaid with annual payments for 6 years, and the interest rate on the loan is 5% per year, compounded annually
 - a \$2500 personal loan is to be repaid in semi-annual installments over 2 years, with interest at 7.6% per year, compounded semi-annually
 - a \$21 000 car loan at 6.6% annual interest, compounded monthly, is to be repaid with monthly payments for 5 years
 - a \$1650 loan is to be repaid with monthly payments for 2 years, with interest at 9% per year, compounded monthly
- Substitute the values for PV, i , and n from each part of question 1 into the formula

$$\text{PMT} = \text{PV} \left[\frac{i}{1 - (1 + i)^{-n}} \right]$$
 to solve for the payment.
 - Use a TVM solver to check your answers to part a).
- Rearrange the future value of an ordinary simple annuity formula

$$\text{FV} = \text{PMT} \left[\frac{(1 + i)^n - 1}{i} \right]$$
 to solve for the payment.
 - Use the formula determine in part a) to calculate the annual payment needed to generate \$10 000 in 5 years if interest is 3.5% per year, compounded annually.
 - Use the formula in part a) to calculate the monthly payment needed to generate \$7000 in 3 years if interest is 3.9% per year, compounded monthly.
- Calculate the total amount paid for the duration of each loan.
 - \$365 per month for 60 months
 - \$506.70 per month for 10 years
 - quarterly payments of \$353.83 for 4 years
 - weekly payments of \$313.08 for 30 years
- Calculate the total amount of interest paid on each loan.
 - \$229 per month for 1 year to pay for a vacation with a pre-tax price of \$2499 (taxes paid at time of purchase)
 - quarterly payments of \$1127 for 6 years to repay a \$24 000 small business loan
 - monthly payments of \$109 for 24 months on a new drum set with a pre-tax price of \$2299 (taxes paid at time of purchase)
 - weekly payments of \$326.92 for 20 years on a \$179 000 home mortgage
- Determine the value of the drum set in question 5, part c) at the time the loan is fully repaid, if the drum set depreciates at 15% per year.
 - Determine the value of the home in question 5, part d) after 20 years if it appreciates by 4% per year.
- Skylene has 4 years to repay an \$8000 loan at 7.8% per year, compounded monthly.
 - Calculate her monthly payment using the appropriate formula.
 - Calculate the total amount Skylene will pay.
 - Calculate the total interest paid over the life of the loan.

Name: _____

Date: _____

8. Ethen wants to purchase a new pickup truck for his small carpentry business. He likes two models. One has a pre-tax cost of \$31 900 and is financed at 1.8% per year. The other has a pre-tax cost of \$28 500 with financing available at a bank for 6.9% per year. Both loans are compounded monthly for 5 years. All taxes will be paid at the time of purchase.
- Determine the monthly payment for each truck.
 - Determine the total cost of each loan. Which truck will cost less after the loans are paid?
 - Determine the total interest that would be paid for each loan.
 - Ethen could also lease the \$31 900 truck and purchase it for \$12 000 when the lease expires. The lease payments are \$349 per month for 5 years. Which option costs less, the loan or the lease? How much less?
9. Shasta would like to buy a high-end laptop that is currently priced at \$4800. She estimates that the price of the laptop will decrease by 20% per year. She has set aside \$600 in a bank account that pays 5.4% annual interest, compounded monthly, for her purchase.
- How much money does Shasta need to deposit each month in order to pay cash for the laptop in 2 years?
 - Shasta decides to make a single deposit into her bank account today to pay for the laptop in 2 years. How much must she deposit?
10. Kareem and Rachel have just purchased a three-bedroom bungalow for \$169 000. Their mortgage is at a fixed rate of 6.3% per year, and it will be amortized over a period of 15 years. All mortgages in Canada have interest compounded semi-annually.
- Use a TVM Solver to determine their monthly payment.
 - What is the total cost of the mortgage?
 - How much interest will they pay in total?
 - Their bungalow is expected to increase in value by 2.25% each year. Calculate the estimated selling price of the bungalow 15 years from now.
 - Use a TVM Solver to determine the number of years (rounded up to the nearest year) required for the expected selling price of the bungalow to be equal to the amount Kareem and Rachel paid for it.