

2.4 Buy, Rent or Lease? (part 2)

**EXAMPLE 3** Solving a problem that involves leasing or buying a water heater

The 10-year-old hot water heater in Tom's home stopped working, so he needs a new one. Tom works for minimum wage. After paying his monthly expenses, he has \$35 **disposable income** left. He has an unused credit card that charges 18.7%, compounded daily. He has two options:



**disposable income**

The amount of income that someone has available to spend after all regular expenses and taxes have been deducted.

- Tom could lease from his utility company for \$17.25 per month. This would include parts and service.
  - He could buy a water heater for \$712.99, plus an installation fee of \$250, using his credit card. He could afford to pay no more than \$35 each month.
- What costs are associated with buying and leasing?
  - What do you recommend for Tom? Justify your recommendation.
  - Suppose that the life expectancy of a water heater is 8 years. Would this change your recommendation? Explain.

a) buying: install, maintenance  
leasing: monthly pmts.

b) cost to buy =  $712.99 + 250 = 962.99$

$N = 36.307$   
 $I = 18.7$   
 $PV = 962.99$   
 $Pmt = -35$   
 $FV = 0$   
 $P/Y = 12$   
 $C/Y = 365$

he will pay in total  
 $(35)(36.307\dots) = 1270.76$   
 $I = 1270.76 - PV = 307.77$

cost to rent  
 $(\$17.25/mo.)(37 months)$   
 $= 638.25$

over about 3 yrs, its cheaper to rent.

c) but if the heater lasts 8 yrs...

average monthly cost  
 $= \frac{1270.76}{96 months}$   
 $(8)(12)$   
 $= 13.24$  \$/month

average monthly  
 $= 17.25$  \$

we save about 4 \$/month on average by buying the heater

**EXAMPLE 4** Solving a problem that involves leasing or buying office space

Lance started his own construction business 2 years ago. His business has grown quickly, and his home office is no longer big enough. He is considering these two options:

- He could sign a 3-year lease on office space, with monthly rental payments of \$2000, and a refundable damage deposit of \$2000, but there is a penalty for breaking the lease.
  - He could purchase a house for \$285 000 and renovate so it could be used as an office. A 5% down payment would be required, and he would take out a 15-year mortgage at 5%, compounded semi-annually, with monthly payments. Assume appreciation of 2% yearly.
- a) What are the costs of leasing over 15 years?
  - b) What are the costs of buying over 15 years?
  - c) What do you recommend for Lance? Justify your advice.

a) leasing: rent, insurance, ut, is  
 $(\$2000/\text{mo.})(15\text{yrs} \times 12\text{mo.})$   
 $= \boxed{360\,000\ \$}$   
 operating cost has some tax deductions

but we have equity  
 $\text{value} = 285\,000 (1 + 0.02)^{15}$   
 $= 383\,572.48\ \$$

actual cost to buy  
 $= 398\,342.14 - 383\,572.48$   
 $= \boxed{\$14769.66}$

c) Even with the cost of renovation, buying is WAY cheaper.

b) buying: mortgage, title transfer fee, insurance, utilities, down payment, RENO  
 down pmt: 5% of 285 000  
 $= 14\,250\ \$$

mortgage =  $285\,000 - 14\,250$   
 $= 270\,750$

$N = 15 \times 12 = 180$

$I = 5\%$

$PV = 270\,750$

$\text{Pmt} = 2133.845$

$FV = 0$

$P/Y = 12$

$C/Y = 2$

Cost = down + total pmts  
 $= 14\,250 + (180)(2133.845\dots)$   
 $= \boxed{398\,342.14\ \$}$