Owning and Operating a Vehicle
Part 1 – Choosing a Vehicle

Three methods of acquiring a vehicle are buying new, buying used, and leasing. The following characteristics can be considered when choosing a vehicle. Rank them from 1 to 11, 1 being the most important to you and 11 being the least important.

<table>
<thead>
<tr>
<th></th>
<th>Very Important</th>
<th>Somewhat Important</th>
<th>Fairly Important</th>
<th>Not Important</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
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<td>Style</td>
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<tr>
<td>Gas Consumption</td>
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<tr>
<td>Maintenance Costs</td>
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<tr>
<td>Reliability</td>
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<td>Safety</td>
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<td>Resale Value</td>
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<tr>
<td>Insurance Rates</td>
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<tr>
<td>Braking System</td>
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<tr>
<td>Rusting</td>
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</tr>
</tbody>
</table>

Select three of the characteristics that you ranked very important and briefly explain why they are important to you.

1. 

2. 

3. 
Part 2 – How do I come up with the money?

If you wish to borrow money to purchase a car, financial planners generally advise that your total monthly debt repayments should be no more than 40% of your net income.

Here are some formulas:

If you are already working and know how much money you earn every month after deductions, calculate your maximum monthly loan payment as follows:

\[ \text{your maximum monthly debt} = \text{monthly net income} \times 0.4 \]

If you have picked out a car and have been told how much your monthly loan payments would be, you can calculated the minimum monthly income you would require to pay off the debt as follows:

\[ \text{your minimum net income} = \text{total monthly loan payments} / 0.4 \]

Example 1

If your monthly net income is $1200.00, what is the maximum monthly debt repayment you can afford?

\[ \text{your maximum monthly debt} = \text{monthly net income} \times 0.4 \]

1,200 \times 0.4 = $480

You can afford a monthly payment of $480.

Example 2

You find a car you like and can borrow the money if you make monthly payments of $600. What is the minimum monthly net income that is needed if you wish to take this loan with monthly repayments of $600?

\[ \text{your minimum net income} = \text{total monthly loan payments} / 0.4 \]

600 / 0.4 = $1,500

You would need to earn $1,500 to afford this monthly payment.
Thought:

Consider the cost of purchasing a vehicle in another province other than Manitoba. What are the benefits and disadvantages? What about another country?

Did you know?

- GST and PST must be paid on a new or used vehicle purchased from a dealer. A vehicle purchased privately requires you pay PST only.
- GST is 5% and PST is 8%.
- A vehicle must be safetied before it can be licensed and driven. If the vehicle is not safetied when you buy it then you must pay for the inspection ($55) plus any necessary repairs.
- Some dealerships charge a documentation fee of $100 to $200 to prepare the paperwork for the vehicle.

Example 3

Calculate the monthly loan payment for a $3,500 loan with an interest rate of 10% and a term of 3 years.

Using the Personal Loan Payment Calculator on page 59 of the text...

Monthly payment is equal to \( \frac{3,500}{1000} \times 32.27 = 112.95 \)
Questions:

1. What is the maximum debt repayment that is recommended for the following monthly net incomes?
   a) $1,250  $500
   b) $2,250  $900
   c) $980  $392

2. What is the minimum income that is recommended for each of the following debts?
   a) $350 a month
      \[ \frac{40}{100} = \frac{350}{X} \]
      \[ X = \frac{350}{0.40} = 875 \]
      $875
   b) $680 a month
      \[ \frac{40}{100} = \frac{680}{X} \]
      \[ X = \frac{680}{0.40} = 1700 \]
      $1700

Do you recall?

You can calculate the monthly loan payment easily by dividing the loan amount by 1000 and then multiplying by the table value that corresponds to your interest rate and term (length of loan).

Monthly loan payment = (loan amount / 1000) x table value

*just like houses & mortgages.*
2. Use the Monthly Loan Payment Table to find the monthly loan payments for the following:

   a) 2-year loan at 6%, borrowing $10,000

   \[
   \frac{10000}{1000} \times 44.32 = $443.20
   \]

   b) 5-year loan at 8%, borrowing $32,540.00

   \[
   \frac{32540}{1000} \times 20.28 = $659.91
   \]

3. Mavis is buying a used Ford Focus from Borderland Ford. The Focus is selling for $12,995 plus PST and GST. Mavis needs to borrow the entire amount from her bank. She has been given a 4-year loan at 9% interest.

   a) How much does the Focus cost including taxes?

   \[
   12995 \times 1.13 = $14684.30
   \]

   b) Use the Loan Payment Table to calculate the monthly loan payment.

   \[
   \frac{14684.35}{1000} \times 24.89 = $365.49
   \]

   c) How much does Mavis end up paying for the Focus after her loan is paid off?

   \[
   365.49 \times 48 = 17543.52
   \]

   d) What is the finance charge?

   \[
   17543.52 - 14684.35 = $2859.17
   \]
4. Marvin is buying a new dirt bike from Winkler Motorsports. The price is $8995 plus both taxes. Marvin has $4000 in his savings account and will use this money for a down payment. He will need to borrow the rest of the money from the bank. His bank has approved a loan with a fixed interest rate of 9.5% for 4 years.

a) How much does the dirt bike cost including taxes?

\[ 8995 \times 1.13 = 10164.35 \]

b) Assuming Marvin uses his savings to help buy the bike, how much does Marvin have to borrow from the bank?

\[ 10164.35 - 4000 = 6164.35 \]

c) Use the Loan Payment Table to calculate Marvin's monthly loan payment.

\[ \frac{6164.35}{1000} \times 25.12 = 154.85 \]

d) After paying off his loan, how much does Marvin end up paying for the motorcycle? Don't forget his down payment.

\[ 154.85 \times 48 = 7432.80 \]
\[ + \frac{4000}{1000} = 11432.80 \]

e) How much money in “finance charges” would Marvin have to pay for borrowing the money?

\[ 11432.80 - 10164.35 = 1268.45 \text{ in finance charges} \]

f) What advantage was there to saving the $4000 before buying the dirt bike?

Pay less interest because you borrow less from bank.
5. Marilyn has found a 1978 Lincoln Mark V for $9,200 plus PST. Marilyn will not pay GST because the car is a private sale. She has saved up $2000 and will need to borrow the rest of the money from the bank. Her bank has approved a loan with a fixed interest rate of 7.5% for 5 years.

a) How much does the Lincoln cost including taxes?

\[ 9200 \times 1.08 = 9936.00 \]

b) How much does Marilyn have to borrow from the bank?

\[ 9936.00 - 2000 = 7936.00 \]

c) Use the Loan Payment Table to calculate Marilyn’s monthly loan payment.

\[ \frac{7936}{100} \times 20.04 = 159.04 \]

d) After paying off her loan, how much does Marilyn end up paying for the Lincoln?

Don’t forget her down payment.

\[ 159.04 \times 60 = 9542.40 \]

\[ + 2000 \]

\[ = 11542.40 \]

\[ $11542.40 \]

e) How much interest in total would Marilyn pay for borrowing the money?

\[ 159.04 \times 60 = 9542.40 \]

\[ - 7936 \text{ borrowed} \]

\[ = 1606.40 \text{ in interest} \]
6. Martin has found a used car at South Park Motors. He has found a low mileage Camaro Z28 for $16,700 plus both taxes. He has saved up $4500, the rest of the money will come from the bank. His bank has approved a loan with a fixed interest rate of 8.25% for 3 years.

a) How much does the Camaro cost including taxes?

\[ 16700 \times 1.12 = \$18,704 \]

b) How much does Martin have to borrow from the bank?

\[ 18704 - 4500 = \$14,204 \]

c) How much would Martin pay each month for this loan?

\[ \frac{14204}{12} \times 31.46 = \$446.86 \]

d) How much does Martin end up paying for the Camaro after his loan is paid off?

\[ 446.86 \times 36 = 16,086.96 + \frac{4500}{120586.96} \]

e) Calculate the finance charges that Martin ended up paying.

\[ 20586.96 - 18704 \]

\[ \$1882.96 \]
Part 3 – Buying a New Vehicle

List several advantages to buying a new vehicle:

- Warranty
- Newer features (safety, convenience)
- No previous wear and tear.

One big disadvantage is:

purchase price is higher than similar used.

Terms

base price – price before options.

documentation fee – added to price to pay for the paper work.

freight charges – from factory to dealer – added on.

optional equipment – grouped together as packages.

preferred equipment package – options grouped together ex. wheel upgrade, leather, DVD player.

sticker price – everything added to base price except taxes.

trade-in allowance – subtracted from sticker price before taxes.
Example 1

Find the sticker price and the price including taxes for the following new car. The base price is $25,880 and it has the following optional equipment:

- preferred equipment package including sunroof, spoiler, and stereo costing $1,260
- six-speed automatic transmission costing $995
- air conditioning tax of $100 and freight of $620 will also be charged.

```
$25,880  base price
+  $1,260  preferred equipment package
+  $995   six-speed automatic transmission
+  $100   air conditioning tax
+  $620   freight

=  $28,855  sticker price
```

```
+  $1,442.75  GST
+  $2,019.85  PST

=  $32,317.60  total amount including taxes
```

Example 2

Donald is going to buy a two-door sports coupe. The base price is $20,798. He adds an options package that costs $1,585, plus he wants an automatic transmission for an additional $695. Freight on the car is $655. The dealership will give him a trade-in allowance of $5,000 on his old car. There is a documentation fee of $150. What is the total price he will pay?

```
$20,798  + $1,585  + $695  + $655  - 5000  + $150
base price  options  auto trans  freight  trade-in  documentation fee

$18,883  + $944.15  + $1,321.81  =  $21,148.96
"sticker price"  GST  PST  Total
```
# Consumer Math 30S
## Owning and Operating a Vehicle

1. Calculate the purchase price of each of the following vehicles:

<table>
<thead>
<tr>
<th>Base Price</th>
<th>Options &amp; Freight</th>
<th>Sticker Price</th>
<th>Doc Fee</th>
<th>Cost of Vehicle</th>
<th>Trade-in</th>
<th>Sub Total</th>
<th>PST</th>
<th>GST</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>$19,400</td>
<td>$2,230</td>
<td>$2,163</td>
<td>$150</td>
<td>$21,780</td>
<td>$5,700</td>
<td>$16,080</td>
<td>$125.60</td>
<td>80.4</td>
<td>$18,099.60</td>
</tr>
<tr>
<td>$27,960</td>
<td>$2,760</td>
<td>$30,720</td>
<td>$185</td>
<td>$30,905</td>
<td>$9,000</td>
<td>$21,905</td>
<td>$1533.35</td>
<td>105.25</td>
<td>$24,333.60</td>
</tr>
<tr>
<td>$15,275</td>
<td>$975</td>
<td>$16,250</td>
<td>$125</td>
<td>$16,375</td>
<td>$7,200</td>
<td>$9,175</td>
<td>$642.25</td>
<td>458.75</td>
<td>$19,276</td>
</tr>
<tr>
<td>$22,740</td>
<td>$1,525</td>
<td>$155</td>
<td>$10,000</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. Find the sticker price for the following car. The base price is $14,765. Its optional equipment package consists of a preferred equipment package costing $1,730, a six-speed automatic transmission costing $765, an AM/FM stereo with CD player costing $350, a 10-inch steering wheel costing $170, power mirrors costing $150, and a tachometer costing $40. In addition, there is an air conditioning tax of $100 and a freight charge of $760.

Base 14,765
1,730
765
350
170
150
40
100
760
\[ \text{Total Price} = \$18,830 \]
3. You are buying a new truck. You would like it to have an AM/FM CD stereo system. Your dealer indicates that it is available in the Premier Equipment Package which includes the stereo, automatic transmission, power antenna, and rust protection. This package costs an additional $2,300. What could you do to help you make a decision?

Do I want all those options or can I get a stereo installed somewhere else for less?

4. Andy, who lives in Brandon, decides to buy a two door convertible. He pays the base price of $24,673 and takes an option package worth $2,614. He adds on the automatic transmission for an extra $695. There is a freight charge of $795 and the options package he selects has air conditioning. Andy receives a trade-in allowance of $4,500 for his old car. How much will he pay for his car?

\[
\begin{align*}
24,673 & \\
+ 2,614 & \\
+ 695 & \\
+ 795 & \\
+ 100 \text{ air tax} & \\
\hline
28,877 & \\
- 4,500 & = 24,377 + \text{pot + got} \\
\hline
27,377 & \\
- 2,24 & \\
\hline
27,153 & \\
\end{align*}
\]
Part 4 – Depreciation

All vehicles lose value as they become older. This is called depreciation. A new car often depreciates by 20% to 30% in its first year, and then by 15% each year after that. As a vehicle depreciates, its resale value decreases.

Terms

Depreciation – loss in value as the vehicle ages.

Depreciation Rate – usually expressed as a %.

Resale Value – price vehicle sells for when used.

Example 1

A new car is sold for $35,000. Calculate the depreciation and the car’s resale value at the end of the first three years. The depreciation rate is 20% for the first year and 15% for each year after that.

year 1 – $35,000 \times 0.20 = $7,000 depreciation, value of car is now $28,000

year 2 – $28,000 \times 0.15 = $4,200 depreciation, value of car is now $23,800

year 3 – $23,800 \times 0.15 = $3,570 depreciation, value of car is now $20,230

Resale Value – $20,230

Total Depreciation – $35,000 - $20,230 = $14,770

OR $7,000 + $4,200 + $3,570 = $14,770
Example 2

Sam purchases a 4-year-old used truck for $10,500. What will Sam's truck be worth after two years if the depreciation rate for this model of truck is 10% a year? What is the total depreciation after two years?

\[ \text{year 1} - \$10,500 \times 0.10 = \$1,050 \text{ depreciation, value of truck is now } \$9,450 \]

\[ \text{year 2} - \$9,450 \times 0.10 = \$945 \text{ depreciation, value of truck is now } \$8,505 \]

\[ \text{Resale Value} - \$8,505 \]

\[ \text{Total Depreciation} - \$10,500 - \$8,505 = \$1,995 \]

\[ \text{OR} \quad \$1,050 + \$945 = \$1,995 \]
1. Determine the resale value and total depreciation of the following new vehicles for the years and depreciation rates given.

a) $17,000 Pontiac at the end of three years (first year 20%, 15% a year thereafter).

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
<th>Depreciation</th>
<th>Remaining Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$17,000</td>
<td>$3,400</td>
<td>$13,600</td>
</tr>
<tr>
<td>2</td>
<td>$13,600</td>
<td>$2,040</td>
<td>$11,560</td>
</tr>
<tr>
<td>3</td>
<td>$11,560</td>
<td>$1,734</td>
<td>$9,826</td>
</tr>
</tbody>
</table>

Resale Value = $9,826

Total Depreciation = $7,174

b) $16,408 Chevrolet at the end of two years (first year 25%, 15% a year thereafter).

<table>
<thead>
<tr>
<th>Year</th>
<th>Value</th>
<th>Depreciation</th>
<th>Remaining Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$16,408</td>
<td>$4,102</td>
<td>$12,306</td>
</tr>
<tr>
<td>2</td>
<td>$12,306</td>
<td>$1,845.90</td>
<td>$10,460.10</td>
</tr>
</tbody>
</table>

Resale Value = $10,460.10

Total Depreciation = $5,947.90
2. Determine the resale value of the following used vehicles for the years and depreciation rates given.

a) $6,000 Nissan light truck three years after purchase (10% depreciation each year).
   year 1 – $6000 \times 0.1 = 600$
   year 2 – $5400 \times 0.1 = 540$
   year 3 – $4860 \times 0.1 = 486$

   Resale Value – $4374$
   Total Depreciation – $6000 - 4374 = \text{\$1626}$

b) $9,800 Subaru station wagon four years after purchase (10% depreciation each year).
   year 1 – $9800 \times 0.9 = 8820$
   year 2 – $8820 \times 0.9 = 7938$
   year 3 – $7938 \times 0.9 = 7144.20$
   year 4 – $7144.20 \times 0.9 = 6429.78$

   Resale Value – $6429.78$
   Total Depreciation – $9800 - 6429.78 = \text{\$3370.22}$
Part 5 - Buying a Used Vehicle

Terms
lien search — check to see if any outstanding debt is still attached to the vehicle.

diagnostic test — check & mechanical condition of the vehicle.

safety check — MB inspection — must pass before you are allowed to put a plate on.

Some things to think about...

Since a new vehicles loses a lot of its value in the first year, and subsequent years, many people prefer to buy a one or two-year-old vehicle. A used vehicle can be difficult to find as you do not want to buy a “lemon”.

When you buy a used vehicle from a dealership you will pay PST, GST, plus at some dealerships, a documentation fee. When you buy privately you only pay PST.

You must pay PST on the book value of the vehicle. This means that if you purchased a car from someone for less than the book value you would still pay PST on the higher book value. For example: You paid $2000 for a car but the book value is $3,500. You pay PST on the $3,500.

Some things to do before buying a used vehicle are (but not limited to):
make sure there are no liens against the vehicle.
make sure you have a written contract (receipt with serial number, seller’s name, etc)
check for dents and damage (have a mechanic look it over)
check the mileage
check the condition of tires and other items that could add to the price of your vehicle
whether seat belts work properly
test drive the vehicle
seek advice from friends and consumer guides
Example 1

Les goes to a reputable dealer in Killarney, MB to buy his car. The sticker price for his car is $5,500. How much will the car cost him?

\[
\begin{align*}
\text{sticker price} & \quad + \quad \text{GST} & \quad + \quad \text{PST} \\
\$5,500 & \quad + \quad \$275 & \quad + \quad \$385 \\

& \quad = \quad \$6,160
\end{align*}
\]

Example 2

Gordie lives in Winnipeg, Manitoba. He wants to buy a car from a private owner, who is asking $1,995 for the car. Gordie needs to do a lien search, which will cost him $26. Since he is not a mechanic, he decides to have a $45 diagnostic test done at Canadian Tire. The mechanic tells him that the car needs some engine work that will cost $650, including labour. When he gets the car licensed, he must pay PST on the book value of the car. The book value is $2,500. He will also have to take the car for a safety inspection for $50 plus PST and GST. How much will the car cost Gordie?

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Base Price of Vehicle</th>
<th>$1,995</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Add Diagnostic Work and/or repairs plus GST and PST</td>
<td>$778.40</td>
</tr>
<tr>
<td></td>
<td>$45 + $650 = $695 plus taxes = $778.40</td>
<td></td>
</tr>
<tr>
<td>Step 3</td>
<td>Add PST to the Book Value of the vehicle ($2500 x 0.07)</td>
<td>$175</td>
</tr>
<tr>
<td>Step 4</td>
<td>Add Safety Check if needed plus PST and GST</td>
<td>$56</td>
</tr>
<tr>
<td>Step 5</td>
<td>Add price of a Lien Search if needed</td>
<td>$26</td>
</tr>
<tr>
<td>Step 6</td>
<td>Find the total</td>
<td>$3,030.40</td>
</tr>
</tbody>
</table>
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Owning and Operating a Vehicle

1. What are the advantages and disadvantages of buying a used vehicle privately rather than through a dealer?
   - No got
   - Might know the owner

2. Charlene goes to a dealer in Winnipeg to buy a used car. The price for the car is $12,430. How much does she pay including taxes?
   \[ 12,430 \times 1.12 = 13,921.60 \]

3. Calculate the total purchase price of a used truck listed at $7,450 at a licensed automobile dealership in Winkler, Manitoba.
   Assume higher than book value
   \[ 7,450 \times 1.12 = 8,344 \]

4. Harry has found a car in Thompson, MB that he likes and wants to buy through a private sale. The price of the car is $2,495. Harry's friend examines the car and recommends that Harry install a new battery for $129 and get a tune-up for a cost of $85. The safety check will cost $40 plus GST. The book value for this car is $2,200. How much will this car cost Harry?
   - \[ 2,495 + \text{pst} \]
   - \[ 129 + \text{taxes} \]
   - \[ 85 + \text{taxes} \]
   - \[ 40 + \text{taxes} \]
   - \[ 174.65 \]
   - \[ 15.48 \]
   - \[ 10.20 \]
   - \[ 4.80 \]
   - \[ 2,954.13 \]
   - What if book value was $3,000?
     - pst would be \[ 3,000 \times 0.07 = 210 \]
     - vs \[ 174.65 \]
Consumer Math 30S

Owning and Operating a Vehicle

5. Linda buys a car to drive to college. The car costs $4,500, a diagnostic test costs $35, and a $26 lien search is done. The safety check costs $55 plus taxes. The book value for this car is $5,000. If this car is bought through a private sale, what is the total cost?

\[
\begin{array}{lcccc}
\text{car} & 4500 \\
\text{diag.} & 35 & 5000 \times 0.08 = 400 \\
\text{safety} & 55 & 35 \times 0.13 = 4.55 \\
\text{lien} & 26 & 55 \times 0.05 = 2.75 \\
\hline
\end{array}
\]

\[
\text{total} = 4500 + 35 + 55 + 26 + 400 + 4.55 + 2.75 = 5023.30
\]

6. Scott wants to buy an older car in Plum Coulee. The owner is asking $800. When he has finished repairing the car the following expenses are recorded before taxes:

- engine work, $700;
- electrical work, $150;
- stereo system, $450;
- tires, $420;
- interior, $900;
- exterior, $600;
- suspension, $150;
- exhaust, $140;
- and other repairs, $190.

The safety check will cost $55 plus GST. The book value for this car is $1,000. How much will Scott have paid in total for this car? He requires a lien search.

\[
\begin{array}{lcccc}
\text{car} & 800 \\
& \text{(1000 \times 0.08)} = 80 \\
\text{safety} & 55 \times 0.05 = 2.75 \\
\text{repairs} & 3700 \times 0.13 = 481 \\
\hline
\text{total} = 800 + 80 + 55 + 2.75 + 481 = 1518.75
\end{array}
\]
Part 6 - Fuel Economy

1. Why do you think a vehicle uses more fuel in the city than on the highway?
   
   stop, go, stop, go

2. What is the most expensive price for gas you have seen in the past year?
   
   $1.249/Litre

3. What is the cheapest price for gas you have seen in the past year?
   
   can't remember

4. What are some reasons that fuel prices change over a year?
   
   supply and demand.
   fuel shortage = high prices

5. Find the cost for each of the following:

<table>
<thead>
<tr>
<th>Litres</th>
<th>Cost/Litre</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>90</td>
<td>101.7</td>
<td>$91.53 = 90 \times 1.017</td>
</tr>
<tr>
<td>18</td>
<td>93.9</td>
<td>$16.90 = 18 \times 0.939</td>
</tr>
<tr>
<td>51.3</td>
<td>89.9</td>
<td>$46.12 = 51.3 \times 0.899</td>
</tr>
<tr>
<td>118</td>
<td>103.9</td>
<td>$122.60 = 118 \times 1.039</td>
</tr>
<tr>
<td>144</td>
<td>154.7</td>
<td>$222.77 = 144 \times 1.547</td>
</tr>
</tbody>
</table>
6. Determine the distance travelled in kilometers using the odometer readings given below:

a) Initial reading: 039287.6   Final reading: 040324.3

\[040324.3 - 039287.6 = 1036.7\]

b) Initial reading: 076543.2   Final reading: 076956.7

\[76956.7 - 76543.2 = 413.5 \text{ km}\]

c) Initial reading: 001279.8   Final reading: 001454.3

\[1454.3 - 1279.8 = 174.5 \text{ km}\]

d) Initial reading: 003883.3   Final reading: 007375.2

\[7375.2 - 3883.3 = 3491.9 \text{ km}\]

Fuel Economy Formula

In Canada, fuel economy is measured in Litres consumed per 100 kilometres of driving. For example, 8.3L/100km means that a vehicle uses 8.3 litres of fuel to drive 100 kilometres. This is different than in the US where fuel economy is measured in miles per gallon.

\[
\text{fuel economy} = \frac{\text{litres} \times 100}{\text{kilometres driven}}
\]

Example

Determine the fuel economy on the following trip:

<table>
<thead>
<tr>
<th>Initial Odometer Reading (km)</th>
<th>Final Odometer Reading (km)</th>
<th>Fuel Used</th>
<th>Fuel Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>071416.0</td>
<td>071739.0</td>
<td>57.6L</td>
<td>(\frac{071739.0 - 071416.0}{323} = 323 \text{ km})</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>((57.6 \times 100) / 323 = 17.8L/100 \text{ km})</td>
</tr>
</tbody>
</table>
7. Determine the fuel economy for each of the following trips using the odometer readings given.

<table>
<thead>
<tr>
<th>Initial Odometer Reading (km)</th>
<th>Final Odometer Reading (km)</th>
<th>Fuel Used</th>
<th>Fuel Economy</th>
</tr>
</thead>
<tbody>
<tr>
<td>023165.2</td>
<td>023721.9</td>
<td>54.8L</td>
<td>( \frac{556.7 \text{ km}}{54.8 \times 100} = 9.84 \text{L/100 km} )</td>
</tr>
<tr>
<td>087158.1</td>
<td>088031.4</td>
<td>97.2L</td>
<td>( \frac{97.2 \times 100}{873.3} = 11.13 \text{L/100 km} )</td>
</tr>
<tr>
<td>015632.1</td>
<td>016341.8</td>
<td>37.2L</td>
<td>( \frac{37.2 \times 100}{709.7} = 5.24 \text{L/100 km} )</td>
</tr>
<tr>
<td>0135714.8</td>
<td>0136028.3</td>
<td>43.9L</td>
<td>( \frac{43.9 \times 100}{313.5} = 14.0 \text{L/100 km} )</td>
</tr>
</tbody>
</table>

8. A pick-up truck travels 92 km on 10 L of gasoline when driven on a smooth, paved road. The truck is only able to travel 78 km on the same amount of gasoline when driven on a gravel road.

a) Determine the fuel economy of the truck on the paved road.

\[
\frac{10 \times 100}{92} = 10.87 \text{L/100 km}
\]

b) Determine the fuel economy of the truck on the gravel road.

\[
\frac{10 \times 100}{78} = 12.8 \text{L/100 km}
\]
9. In the city, an SUV requires 29.8 L to travel a distance of 250 km. On the highway, it requires 31.8 L to travel a distance of 340 km.

a) Determine the fuel economy of the SUV in the city.

\[
\frac{L \times 100}{\text{dist.}} \rightarrow \text{city} \quad \frac{29.8 \times 100}{250} = \frac{11.92}{100} \text{ km/L}
\]

b) Determine the fuel economy of the SUV on the highway.

\[
\frac{31.8 \times 100}{340} = \frac{9.35}{100} \text{ km/L}
\]

10. A van requires 46.1 L to drive 380 kilometres.

a) Determine the fuel economy of the van.

\[
\frac{46.1 \times 100}{380} = \frac{12.13}{100} \text{ km/L}
\]

b) If the cost of gasoline is 103.9 cents per litre, find the cost of driving the van 380 kilometres.

\[
46.1 \text{ litres used} \
\times 1.039 \text{ (price of fuel)} \\n\underline{\text{\$47.90}}
\]
11. Francis travelled a total of 500 km in the city and 1200 km on the highway. His car has a fuel economy of 11.9L/100 km in the city, and 7.5L/100 km on the highway. Gasoline costs 104.7 cents per litre.

   a) Calculate the number of litres of fuel used.

   City: \( \frac{500}{100} \times 11.9 = 59.5 \text{ L} \)

   Highway: \( \frac{1200}{100} \times 7.5 = 90 \text{ L} \)

   Total: \( 149.5 \text{ L} \)

   b) Calculate the cost for the fuel.

   \( 149.5 \text{ L} \times \frac{104.7 \text{ cents}}{100} = \$156.53 \)

12. While on a holiday, Olga travelled a total of 800 km in the city, and 1000 km on the highway. Her car has a fuel economy of 13.9L/100 km in the city, and 8.6L/100 km on the highway. Gasoline costs 85.9 cents per litre.

   a) Calculate the number of litres of fuel used.

   City: \( \frac{800}{100} \times 13.9 = 111.2 \text{ L} \)

   Highway: \( \frac{1000}{100} \times 8.6 = 86 \text{ L} \)

   Total: \( 197.2 \text{ L} \)

   b) Calculate the cost for the fuel.

   \( 197.2 \text{ L} \times \frac{85.9 \text{ cents}}{100} = \$169.39 \)
Part 7 – Insurance

When you buy vehicle insurance, you pay a premium. The amount of your basic premium depends on how you use your vehicle, where you live, and your claim record. If you do not intend to use your vehicle to drive to work you can insure it as pleasure use only. You are allowed to drive it to work several times a month but if you drive to work more often, you need to change your insurance to all-purpose. The area where you live is called a territory and it affects your rates. City rates and rural rates are different. Your driving record is also a big factor that affects your premiums. Driving claim free for a number of years can reduce the amount you pay for insurance.

Terms

premium — the amount you pay every you to register your car. Manitoba Public Insurance gives you the option of paying yearly, quarterly, or monthly.

deductible — is the amount you pay if you make an accident claim and need to get your vehicle repaired. Some common deductibles are $500, $300 and $200.

glass coverage – when you reduce your deductible from $500 down to $300, you get glass coverage. This means you can have your windshield replaces for a reduced rate. Without glass coverage you are responsible for paying the replacement costs yourself.

basic coverage – the minimum insurance required by law.

collision insurance – covers damages to your vehicle due to a collision.

comprehensive insurance – covers all damages and mishaps that can happen to your vehicle such as vandalism, theft, or water damage.

third-party liability – is protection for damages that you have caused against another person’s property, or personal injury or death as a result of your negligence. You are protected up to the amount that you choose should you be sued.

safe driving discount – is a reduction in the insurance premium given to vehicle owners with good (accident free) driving records.

at-fault claims – when you make an insurance claim for an accident that you caused. Manitoba Public Insurance will need to determine whether you are 100%, 50%, or not at fault when you make an accident claim.
1. Why is it important to take out insurance on cars, trucks, motorcycles, ATVs, and other vehicles?
   
   Protection from accidents, hail, theft, etc.

2. What does "third party liability" mean?

   To be liable (at fault)
   Protection for yourself - if sued, you are covered.

3. Why do you think it is important to have third party liability insurance?

   Things that are your fault can happen - also, when driving in USA.

4. What does "comprehensive insurance" mean?

   ALL coverage.

5. What does "collision insurance" mean?

   Vehicle to vehicle collisions.

6. What does "deductible" mean?

   You pay your deductible, MPI pays the rest.

   Ex. $6000 damage, you pay $500, MPI pays $5500.
7. Which costs more, $500 deductible or $200 deductible? Why do you think this is so?

$200 gives you better protection so it costs more per year. (higher premium)

8. What is “storage” insurance?

non-moving, can’t use it on the road.

9. Why do you think insurance costs more in a city than it does in a small town or rural area?

higher risks

accidents, theft, vandalism.

10. Why do you think insurance costs less for pleasure use than for commuting to and from work?

busy time of day on roads would be “work-time”.

11. What should you do if you commute from outside the city to the city? Does your insurance change? Use mpi.mb.ca to find this out.

Yes, this is one of the check box options. You commute into a high risk zone.

12. How do you think driving safely can affect your insurance premiums?

Yes, discounts as high as 33%.
Part 8 – Leasing a Vehicle

Leasing a vehicle is a popular way to finance a vehicle, especially for businesses. Instead of purchasing a vehicle outright, you can lease a vehicle.

When you lease a vehicle you pay a set amount each month for a specified number of months. At the end of this time you can either purchase the vehicle or lease another one.

If you choose to purchase the vehicle, you must pay a set price called the residual value.

Advantages to leasing a vehicle are a low or no down payment and low monthly lease payments compared to loans. For businesses, there is also a tax advantage because the monthly payments are a business expense that lowers income tax.

With a leased vehicle, you always have a newer vehicle under warranty.

A disadvantage is that you do not actually own the vehicle during the time you are leasing, and the vehicle can be more expensive if you choose to buy it outright at the end of the lease term.

Terms

lease term –

usually 3 years or 4 years.

lease payment –

monthly payment – need to add taxes

residual value –

price to buy car at end of lease. Also called the “buyout”.

security deposit –

not sure. There is often a down payment required at start of more expensive vehicle leases.

Sounds like a rental scenario.
Example 1

The following describes a new SUV for sale on a dealership lot.

**Cash Price**
The cost of the vehicle is $34,000 plus taxes (freight is included in this price). This is the price if you would pay cash or arrange your own financing through your bank.

**Lease Price**
The monthly lease payment is $349 plus taxes for a lease term of 36 months.

For leasing, a down payment of $3,850 is required.

As well, a refundable security deposit of $500 and the first month's payment must be made when the lease is signed.

The residual value rate is 75% after three years.

a) Calculate the total monthly lease payment including taxes.

\[
\begin{align*}
\text{lease payment} & \quad + \quad \text{GST} & \quad + \quad \text{PST} & \quad = \quad \text{lease payment including taxes} \\
$349 & \quad + \quad $17.45 & \quad + \quad 24.43 & \quad = \quad $390.88
\end{align*}
\]

b) Calculate the total lease payment over the length of the lease.

\[
\begin{align*}
\text{down payment} & \quad = \quad $3,850 \\
\text{monthly lease payments} & \quad = \quad $390.88 \times 36\text{ months} \quad = \quad $14,071.68 \\
\text{Total lease payments} & \quad = \quad $17,921.68
\end{align*}
\]

c) Calculate the amount which must be paid at the start of the lease.

\[
\begin{align*}
\text{down payment} & \quad = \quad $3,850 \\
\text{refundable security deposit} & \quad = \quad $500 \\
\text{first month's lease payment} & \quad = \quad $390.88 \\
\text{Total paid at start of lease} & \quad = \quad $4,740.88
\end{align*}
\]
d) Calculate the residual value of the vehicle after 3 years (including taxes).

*Residual value is new value multiplied by 75%.*

\[ \$34,000 \times 0.75 = \$25,500 \]

**Example 2**

For the vehicle in Example 1 above, at the end of the three-year lease you have the option of returning the vehicle or purchasing it for its residual value. Calculate the total price you would pay for the vehicle if you purchase it after the three-year lease is over.

- **Total lease payment (including taxes)**
  \[ \$17,921.68 \]

- **Residual value (including taxes)**
  \[ \$25,500 + \$1,275 \text{ GST} + \$1,785 \text{ PST} = \$28,560.00 \]

**Total cost of purchasing leased vehicle is:**

\[ \$17,921.68 + \$28,560 = \$46,481.68 \]

**Hints:**

- Total monthly payment: monthly payment + taxes
- Total lease payment: down payment + number of months x total monthly payment
- Total residual value: price of vehicle x residual value rate (as a decimal) + taxes
- Total cost to purchase: total residual value + total lease payment
Owning and Operating a Vehicle

1. A vehicle at a dealership has the following lease agreement:
   
<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Down payment</td>
<td>$3,000</td>
</tr>
<tr>
<td>Lease payment</td>
<td>$250 a month plus taxes</td>
</tr>
<tr>
<td>Lease term</td>
<td>24 months</td>
</tr>
<tr>
<td>Security deposit</td>
<td>$500</td>
</tr>
</tbody>
</table>

   a) Calculate the total monthly lease payment including taxes.
   
   \[ 250 \times 1.13 = 282.50 \]

   b) Calculate the total lease payment (over the 24 months).
   
   \[ 282.50 \times 24 = 6780 \]

   \[ $500 \text{ security deposit} + $3000 \text{ down payment} \]

   \[ $9780 \text{ total} \]

   c) Calculate the amount that must be paid at the start of the lease.
   
   \[ $500 + $3000 + 282.50 \text{ first payment} \]

   2. A lease vehicle in Flin Flon, MB, is priced at $35,500. The residual value rate is 70% after four years. What is the residual value including taxes?

   \[ 35500 \times 0.70 = 24850 \]

   \[ 24850 \times 1.13 = 28080.50 \]

   3. A government-leased vehicle in Brandon, MB, has a residual value of $29,552.77 (taxes included) and total lease payments of $16,545.15 (taxes included). What will be the total cost of purchasing this leased vehicle after the lease term ends?

   \[ 29552.77 + 16545.15 = 46097.92 \]
4. An SUV sells for $34,200 and leases for $348 per month plus taxes for a 48-month lease. A down payment of $3,500 is required. The guaranteed residual value of the SUV at the end of the lease is $16,526.

a) Calculate the monthly lease payment.

\[ 348 \times 1.13 = \$393.24 \]

b) Determine the total lease payment.

\[ 393.24 \times 48 = \$18875.52 \]

\[ + 3500 \]

\[ = 22375.52 \]

\[ \text{CPT} \]

\[ \text{down payment} \]

\[ \text{lease payments (incl. down payment)} \]

\[ 22375.52 \]

\[ + 16526 \]

\[ + \text{PST} 1300.48 \]

\[ + \text{GST} 826.30 \]

\[ = 41028.30 \]

c) Calculate the total cost of the SUV if it is purchased at the end of the lease.
5. A 4 x 4 pickup is leased for $329 a month plus taxes for a lease term of 30 months. A down payment of $3,500 is required. The sale price is $30,050 and the guaranteed residual value rate is 75%.

a) Calculate the total lease monthly payment.

\[ 329 \times 1.12 = \$368.48 \]

b) Calculate the total lease payment over the term of the lease.

\[ 368.48 \times 30 = 11054.40 \]

\[ +3500 \text{ down payment} \]

\[ = 14554.40 \]

c) Calculate the guaranteed residual value.

\[ 30050 \times 0.75 = 22537.50 \]

\[ +\text{taxes} = 2704.50 \]

\[ = \$25242.00 \]

d) Calculate the total cost if the vehicle is purchased outright at the end of the lease.

\[ \text{leasing:} \ 14554.40 \]

\[ + \]

\[ \$39,796.40 \]

e) Calculate the difference between the total cost if the vehicle is purchased outright at the end of the lease and the cost of the vehicle if it is purchased outright at time of purchase.

\[ "Cash" = 30,050 + \text{taxes} = \$33656 \]

\[ 39796.40 - 33656 \]

\[ = \$6140.40 \]