

Worksheet 7-7: Expenses of Operating a Vehicle

Once you obtain a car of your own, the expenses really start to mount! Expenses or costs of operating a car can be divided into two main categories: **fixed and variable**.

Fixed costs are expenses that remain the same from one month to the next, and they are not related to how often you use your car.

Variable costs are expenses that vary in their amount or their frequency, and they differ from one month to the next depending on how you operate your car.

1. Categorize each automobile expense as either a fixed expense or a variable expense.

(a) <u>lease payment</u>	<u>fixed</u>	(b) parking fines	<u>variable</u>
(c) <u>insurance</u>	<u>fixed</u>	(d) gasoline	<u>variable</u>
(e) <u>depreciation</u>	<u>variable</u>	(f) loan payment	<u>fixed</u>
(g) <u>licence plate sticker</u>	<u>fixed</u>	(h) oil changes	<u>variable</u>
(i) <u>highway tolls</u>	<u>variable</u>	(j) monthly parking permits	<u>fixed</u>
(k) <u>maintenance/repair</u>	<u>variable</u>	(l) car wash	<u>variable</u>

Insure a Vehicle:

2. Rahim is 19 and single, and he owns a seven-year-old mid-sized car. He called several insurance agents and the lowest quote he received was \$2620/year. There are two payment options: he can pay the insurance premium in full once a year, or he can make monthly payments of \$230.

(a) Calculate the annual cost if he chooses the monthly instalments.

$$\begin{aligned}
 & \$230 \times 12 \\
 & = 2760
 \end{aligned}$$

The annual cost is \$2760.

(b) Calculate the difference between the two payment methods.

$$\begin{aligned}
 & \$2760 - 2620 \\
 & = 140
 \end{aligned}$$

The difference is \$140.

(c) Suggest reasons why Rahim might choose each option.

Annual → It is \$140 less (to save money)
 → Do not have to worry about missing a payment

Monthly → They do not have a lump sum at the beginning right away (no cashflow)

→ They a regular paid job.

Calculate Fuel Costs:

Fuel Efficiency is a measure of how far a vehicle travels per unit of fuel. Common units of fuel efficiency are litres per 100 km (L/100 km) and miles per gallon (mpg). A vehicle that uses less fuel to travel 100 km is more fuel-efficient.

3. Mr. Tychie's truck has a 76-L fuel tank and a fuel efficiency rating of 11.8L/100 km.

(a) Explain what the fuel efficiency rating on Mr. Tychie's truck means.

Under normal use, 11.8 L of gasoline is used to drive 100 km.

(b) How far, to the nearest kilometre, can Mr. Tychie's truck travel on one tank of fuel?

$$\frac{11.8 \text{ L}}{100 \text{ km}} = \frac{76 \text{ L}}{x}$$

$$x = \frac{100 \times 76}{11.8} = 644 \text{ km}$$

76 L
∴ one tank can travel 644 km

(c) How much fuel, to the nearest litre, would his truck use on a 450-km trip?

$$\frac{11.8 \text{ L}}{100 \text{ km}} = \frac{x}{450 \text{ km}}$$

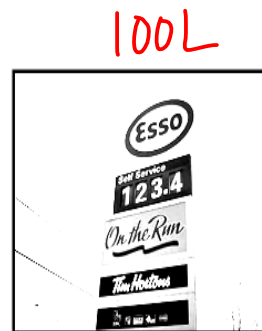
$$\frac{11.8 \times 450}{100} = x$$

$$x = 53 \text{ L}$$

∴ 450-km trip uses 53 L of fuel.

(d) Explain how to determine the cost of the fuel for the trip in part (c).

Multiply current price of a litre of fuel by 53 L.



(e) What is the cost of the fuel for the trip at the current price of one litre of gas?

$$53 \times \frac{123.4}{100}$$

$$= 65.40$$

∴ The cost of fuel is \$65.40.

Depreciation:

Depreciation is the amount that the value of an item decreases over time. For a vehicle, depreciation is the amount by which the vehicle loses value over time.

4. A new mid-sized vehicle sells for \$21 135. Maria researched used cars of the same model and found the following information.

Age of Vehicle (years)	Average Selling Price (\$)
1	16 000
2	12 750
3	11 000
4	9 800

- (a) Calculate the depreciation of the vehicle during the first year, in dollars.

$$21135 - 16000 = 5135$$

The depreciation during the first year in dollars is \$5135.

- (b) Calculate the depreciation after one year, as a percent of the new vehicle price.

$$\frac{\text{part}}{\text{whole}} \times 100 = \frac{5135}{21135} \times 100 = 24\%$$

Depreciation after 1 year as a percent is 24%.

- (c) Calculate the depreciation after four year, as a percent of the new vehicle price.

$$\frac{21135 - 9800}{21135} \times 100 = \frac{11335}{21135} \times 100 = 54\%$$

Depreciation after 4 years as a percent is 54%.

5. A new car worth \$14 595 sells for \$12 259 one year later. Calculate its depreciation, in dollars.

$$14595 - 12259 = 2336$$

Depreciation in dollar is \$2336

$$\text{As a percent} \rightarrow \frac{2336}{14595} \times 100 = 16\%$$