Buy, lease or rent?

Thinking map — keep it next to you while you work

🧭 Five questions before you write

1. 🔎 **Given** For each option, list every cash flow over the SAME number of years: down payment, each payment times the number of months, end fees, and what you own at the end (its resale value).
2. 🎯 **Asked** Which option has the lower NET cost, and by how much? Then give a one-sentence recommendation with a reason.
3. ✏️ **Picture it** A two-column table, Buy | Lease (or Rent | Own). One line per cost; the buy column ends with "− resale value".
4. 🧰 **Tool** Resale value $V = P(1 - r)^t$; appreciation $V = P(1 + r)^t$. A loan payment comes from the payment formula or TVM. For a home, count only interest, tax, strata, maintenance and lost return; a Canadian fixed-rate mortgage is quoted compounded semi-annually (C/Y $= 2$, P/Y $= 12$).
5. ✅ **Check** Same time span on both sides? Resale less than the price? A lower monthly payment does NOT mean a lower total.

⭐ Must know

- Buy: net cost = total paid − value at the end. Lease: down + payments + end fees; you own nothing.
- Depreciation compounds: $V = P(1 - r)^t$; appreciation: $V = P(1 + r)^t$.
- Rent vs buy: compare unrecoverable costs; mortgage principal is equity, not a cost.

$$V = P(1 - r)^t$$

$$V = P(1 + r)^t$$

🔍 Watch out for

1. Comparing only the monthly payments
2. Forgetting to subtract the resale value
3. Taking the same amount off every year
4. Multiplying by the rate instead of what is kept
5. Counting the whole mortgage payment as a cost

🌱 Small wins — tick as you go

- ○ I can turn "loses 15% a year" into the multiplier 0.85 and do a growth or a net-cost calculation. (5′)
- ○ I can list every cost of both options over the same number of years, including what I own at the end. (5′)
- ○ I can follow, then finish, a buy-versus-lease comparison in a two-column table. (10′)
- ○ I can compare buying and leasing a car on my own with at most two hints. (8′)
- ○ I can spot the five classic buy, lease and rent mistakes in someone else's work. (8′)
- ○ I can do the Level 1–2 practice questions and end with a one-sentence recommendation. (10′)

Prerequisite repair sheet

Do the question first. Missed it? Read the rule and the worked lines under it, then try again.

1. A car loses 15% of its value each year. Each year its value is multiplied by…
A. 0.15 B. 0.85 C. 1.15 D. 85

If you missed it — **Percent, decimals and rates**: Percent to decimal: divide by 100 ($4.5\% = 0.045$). A rate per year split into n periods is $\frac{r}{n}$ per period: 6% compounded monthly is 0.005 per month. Increase by r: multiply by $(1 + r)$.

1. $\$200$ increased by 3%: $200 \times 1.03 = 206$.
2. 3.6% compounded quarterly: $\frac{0.036}{4} = 0.009$ per quarter.

2. Evaluate $20\,000(0.9)^2$.
A. $16\,200$ B. $16\,000$ C. $18\,000$ D. $324\,000\,000$

If you missed it — **Exponent rules (product, quotient, power)**: Same base: multiply → ADD exponents ($x^3x^4 = x^7$); divide → SUBTRACT ($x^7 \div x^2 = x^5$); power of a power → MULTIPLY ($(x^3)^2 = x^6$). A power of a product hits every factor: $(2x)^3 = 8x^3$.

1. $(3x^2)^2 \cdot x = 9x^4 \cdot x = 9x^5$.
2. $\frac{6x^5}{2x^2} = 3x^3$ (divide the numbers, subtract the exponents).

3. A home worth $\$400\,000$ rises 3% in a year. What is it worth then?
A. $\$412\,000$ B. $\$403\,000$ C. $\$1\,600\,000$ D. $\$388\,000$

If you missed it — **Percent, decimals and rates**: Percent to decimal: divide by 100 ($4.5\% = 0.045$). A rate per year split into n periods is $\frac{r}{n}$ per period: 6% compounded monthly is 0.005 per month. Increase by r: multiply by $(1 + r)$.

1. $\$200$ increased by 3%: $200 \times 1.03 = 206$.
2. 3.6% compounded quarterly: $\frac{0.036}{4} = 0.009$ per quarter.

4. You paid $\$21\,500$ in total for a car and sold it for $\$9800$. What was your net cost?
A. $\$11\,700$ B. $\$31\,300$ C. $-\$11\,700$ D. $\$12\,300$

If you missed it — **Negative numbers: add, subtract, multiply**: Subtracting a negative is adding: $5 - (-3) = 5 + 3 = 8$. Same signs multiply to $+$, different signs to $-$. Squaring a negative is positive: $(-4)^2 = 16$, but $-4^2 = -16$ (the square happens first).

1. $-7 - (-2)$: change "minus negative" to "plus": $-7 + 2 = -5$.
2. $(-3)(-5) = 15$ (same signs), $(-3)(5) = -15$ (different signs).
3. Plugging in $x = -3$ to x^2: write brackets first, $(-3)^2 = 9$.

Answers: 1: B · 2: A · 3: A · 4: A

🔍 Common-errors sheet

1. Comparing only the monthly payments

A $\$26\,000$ car. Lease: $\$2000$ down, $\$329$ a month for 48 months, $\$500$ in fees. Buy: no down payment and a loan of $\$580$ a month for 48 months, then sell the car (it loses 15% a year). Which costs less over 4 years?

1 Lease: $\$329$ a month. Loan: $\$580$ a month.

2 The lease is $\$251$ a month less, so leasing costs less.

✍ Which line goes wrong first, and why?

2. Forgetting to subtract the resale value

Buy a $\$28\,000$ car for cash (it loses 15% a year and is sold after 3 years), or lease: $\$2500$ down, $\$359$ a month for 36 months, $\$400$ in fees?

1 Buy: $\$28\,000$

2 Lease: $2500 + 359 \times 36 + 400 = \$15\,824$

3 Leasing is cheaper by $\$12\,176$.

✍ Which line goes wrong first, and why?

3. Taking the same amount off every year

A $\$24\,000$ car loses 20% of its value each year. What is it worth after 3 years?

1 Each year it loses $0.2 \times 24\,000 = 4800$.

2 $V = 24\,000 - 3(4800) = 9600$

✍ Which line goes wrong first, and why?

4. Multiplying by the rate instead of what is kept

A $\$15\,000$ car loses 10% of its value each year. What is it worth after 2 years?

1 $V = 15\,000(0.1)^2$

2 $V = \$150$

✍ Which line goes wrong first, and why?

5. Counting the whole mortgage payment as a cost

Rent is $\$2000$ a month. Owning a similar home this year: mortgage payments $\$24\,000$ (of which $\$15\,000$ is interest), property tax $\$2000$, strata $\$3600$, maintenance $\$1200$, lost return on the down payment $\$2500$. Which costs less in money you never get back?

1 Own: $24\,000 + 2000 + 3600 + 1200 + 2500 = \$33\,300$

2 Rent: $2000 \times 12 = \$24\,000$

3 Renting is $\$9300$ cheaper.

✍ Which line goes wrong first, and why?

Key (fold this part back)

1. **line 2** — A lease payment is low because you never own the car. Buying hands you a car worth thousands at the end, and the monthly numbers ignore that. Lease: $2000 + 329 \times 48 + 500 = \$18\,292$. Buy: $580 \times 48 = 27\,840$, minus resale $26\,000(0.85)^4 \approx 13\,572.16$, gives $\$14\,267.84$. Buying is about $\$4024.16$ cheaper.
2. **line 1** — After 3 years the buyer still owns a car and sells it. That money comes back, so it must be taken off the buy side. Resale $28\,000(0.85)^3 \approx \$17\,195.50$, so the net cost of buying is $\$10\,804.50$. Buying is cheaper by $\$5019.50$.
3. **line 1** — The 20% is taken from the value AT THAT TIME. After year 1 the car is worth less, so 20% of it is less than $\$4800$. It keeps 80% each year: $V = 24\,000(0.8)^3 = \$12\,288$.
4. **line 1** — Losing 10% means keeping 90%. Multiplying by 0.1 keeps only 10% each year, which is why the answer is absurdly small. $V = 15\,000(0.9)^2 = \$12\,150$.
5. **line 1** — Only the $\$15\,000$ of interest is gone. The other $\$9000$ pays down the loan, so it stays yours as equity in the home. Own: $15\,000 + 2000 + 3600 + 1200 + 2500 = \$24\,300$. Renting is cheaper by only $\$300$, so a small rise in the home's value would tip it the other way.