

Financial Literacy

Ontario MTH1W · Financial Literacy: budgets, appreciation and depreciation, simple and compound interest, cost of credit

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Worksheet, answers &
this cheat sheet



MOST TESTED \$3500 is invested at 4% per year, compounded annually, for 6 years. Find the amount and the interest earned. (card 5)

Which formula?

Interest on the principal only

$$I = Prt$$

Interest on interest, or a value appreciates

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

A value depreciates each year

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

1 Income and expenses

net = gross – deductions

USE Budget from **net income** (take-home pay). Needs are non-discretionary; wants (concerts, eating out) are discretionary.

Each month, the amount is:

the same **fixed: rent, insurance**
different **variable: groceries, hydro**

TRAP Gross \$2600, deductions \$520: budget the net \$2080, not \$2600.

2 Surplus or deficit

USE Savings is a planned line, not whatever is left. One year: monthly amount $\times 12$.

Net income minus expenses (savings included):

positive **surplus**
zero **balanced**
negative **deficit: cut wants or earn more**

EXAMPLE Net \$1850, expenses \$1690: surplus \$160 a month, $160 \times 12 = 1920$ a year.

TRAP A \$380 shelf price costs $380 \times 1.13 = 429.40$ with 13% HST: budget \$429.40.

3 Appreciation and depreciation

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

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

USE P is the starting value, r the yearly percent as a decimal (5% is 0.05), t the years. Compare two items at the same t .

TRAP Losing 20% a year for 5 years leaves $0.8^5 \approx 0.33$ of the value, not 0.

TRAP \$900 bike, down 30% a year: $900 \times 0.7^2 = 441$ after 2 years, not $900 - 270 - 270 = 360$.

4 Simple interest

$$I = Prt \quad A = P + I$$

USE r per year as a decimal, t in **years** (9 months: $t = 0.75$). To solve for one letter, divide I by the other two: $r = I \div (Pt)$.

EXAMPLE \$1500 at 6% for 2 years:
 $I = 1500(0.06)(2) = 180$; total \$1680.

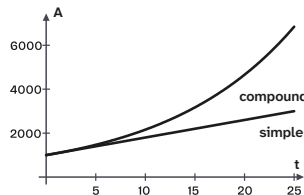
TRAP \$800 at 5% for 18 months:
 $I = 800(0.05)(1.5) = 60$, not $800(0.05)(18) = 720$.

5 Compound interest

$$A = P(1 + r)^t \quad I = A - P$$

$$P = \frac{A}{(1 + r)^t}$$

USE Compounded annually: each year earns interest on the new balance. A goal later, money today: solve for P .



EXAMPLE \$3500 at 4% for 6 years:
 $3500(1.04)^6 \approx 4428.62$; interest \$928.62.

TRAP \$1000 at 8% compounded for 3 years: $1000(1.08)^3 \approx 1259.71$, not $1000 + 3 \times 80 = 1240$.

6 Cost of credit

total = down + $n \times$ payment

cost = total – price

USE n is the number of payments (3 years monthly: $n = 36$). Compare plans by total cost.

EXAMPLE \$900 TV, \$100 down + 24 payments of \$38: total \$1012, cost of credit \$112.

TRAP 48 payments of \$300 total \$14 400, more than 30 payments of \$410 (\$12 300).

TRAP \$200 down plus 12 payments of \$80 is \$1160 in total, not \$960.

7 Plan a goal

USE Surplus from net income; goal price with 13% HST; months = goal $\div$ saving, rounded up.

EXAMPLE \$900 + HST is \$1017; at \$160 a month, $1017 \div 160 \approx 6.4$, so 7 months.

TIP At 5% a year, \$1000 becomes \$2653 in 20 years, \$7040 in 40.

TRAP A \$20 000 car, down 18% a year, is worth \$13 448 after 2 years: maybe less than the loan.