Simple Interest:

$$I = Prt$$

I = Interest

P = Principal

r = interest rate (decimal)

t = time in years

Compound Interest:

$$A = P\left(1 + \frac{r}{n}\right)^{nt}$$

A = Final amount (Interest + Principal)

P = Principal

r = interest rate (decimal)

n = number of compounds.

t = time in years

Troy borrows $5620.00 to purchase a four wheeler. He takes out personal loan from his credit union at an annual rate of 5% with an amortization period of 5 years. Use the personal loan payment calculator table (page 132) to answer the questions.

PERSONAL LOAN PAYMENT CALCULATOR: MONTHLY PAYMENT PER $1000.00 BORROWED (INTEREST COMPOUNDED MONTHLY)

Interest rate (%)	*Term in years*				
	1	*2*	*3*	*4*	*5*
3.00	84.69	42.98	29.08	22.13	17.97
3.25	84.81	43.09	29.19	22.24	18.08
5.00	85.61	43.87	29.97	23.03	18.87
5.25	85.72	43.98	30.08	23.14	18.99
5.50	85.84	44.10	30.20	23.26	19.10
5.75	85.95	44.21	30.31	23.37	19.22
6.00	86.07	44.32	30.42	23.49	19.33
6.25	86.18	44.43	30.54	23.60	19.45
6.50	86.30	44.55	30.65	23.71	19.57
6.75	86.41	44.66	30.76	23.83	19.68
7.00	86.53	44.77	30.88	23.95	19.80

a) What is Troy's monthly payment?

(i) $5620.00 / 1000.00 = 5.62

(ii) 18.87 × 5.62 = $106.05/month

b) Calculate the total amount he will pay over the 5 years. 5 × 12 = 60 months

$106.05 × 60 = $6363.00

c) Calculate the finance charge on the loan.

$6363.00 − $5620.00 = $743.00

- Calculate cost after tax
- Subtract down payment

John is purchasing a new car which costs $42,000.00. He has a down payment of $5000.00. He takes out a personal loan from his local bank at an annual rate of 5.75% and an amortization period of 4 years. (Use 15% HST)

- $42000 \times 1.15 = 48300$
- $48300 - 5000 = 43300$

He needs to borrow 43300.00

PERSONAL LOAN PAYMENT CALCULATOR: MONTHLY PAYMENT PER $1000.00 BORROWED (INTEREST COMPOUNDED MONTHLY)

Interest rate (%)	*Term in years*				
	1	*2*	*3*	*4*	*5*
3.00	84.69	42.98	29.08	22.13	17.97
3.25	84.81	43.09	29.19	22.24	18.08
5.00	85.61	43.87	29.97	23.03	18.87
5.25	85.72	43.98	30.08	23.14	18.99
5.50	85.84	44.10	30.20	23.26	19.10
5.75	85.95	44.21	30.31	23.37	19.22
6.00	86.07	44.32	30.42	23.49	19.33
6.25	86.18	44.43	30.54	23.60	19.45
6.50	86.30	44.55	30.65	23.71	19.57
6.75	86.41	44.66	30.76	23.83	19.68
7.00	86.53	44.77	30.88	23.95	19.80

a) What is John's monthly payment?

(i) $\frac{43300}{1000} = 43.3$

(ii) $23.37 \times 43.3 = \$1011.92/\text{month}$

b) Calculate the total amount he will pay over the 4 years. $4 \times 12 = 48$ months

$\$1011.92 \times 48 = \$48572.16$

c) Calculate the finance charge on the loan.

$\$48572.16 - \$43300 = \$5272.16$

- Subtract the trade in
- Calculate the cost after tax

Jack is purchasing a new trailer which costs $36 000.00. He is trading in his old trailer which they valued at $15 000.00. He takes out a personal loan from his local bank at an annual rate of 5.25% and an amortization period of 5 years. (Use 15% HST)

- $36000.00 - 15000.00 = 21000.00
- $21000 \times 1.15 = 24150.00$

He needs to borrow $24150.00

PERSONAL LOAN PAYMENT CALCULATOR: MONTHLY PAYMENT PER $1000.00 BORROWED (INTEREST COMPOUNDED MONTHLY)

Interest rate (%)	Term in years				
	1	2	3	4	5
3.00	84.69	42.98	29.08	22.13	17.97
3.25	84.81	43.09	29.19	22.24	18.08
5.00	85.61	43.87	29.97	23.03	18.87
5.25	85.72	43.98	30.08	23.14	18.99
5.50	85.84	44.10	30.20	23.26	19.10
5.75	85.95	44.21	30.31	23.37	19.22
6.00	86.07	44.32	30.42	23.49	19.33
6.25	86.18	44.43	30.54	23.60	19.45
6.50	86.30	44.55	30.65	23.71	19.57
6.75	86.41	44.66	30.76	23.83	19.68
7.00	86.53	44.77	30.88	23.95	19.80

a) What is Jack's monthly payment?

(I) $\frac{24150.00}{1000.00}$ = 24.15

(II) 18.99 × 24.15 = $458.61/month

b) Calculate the total amount he will pay over the 5 years. 5 × 12 = 60 months

$458.61 × 60 = $27516.60

c) Calculate the finance charge on the loan.

$27516.60 - $24150 = $3366.60

- Subtract the trade in
- Calculate the cost after tax

Jill is purchasing a new car which costs $32 500. She is trading in her old vehicle which they valued at $9 000. She takes out a personal loan from her local bank at an annual rate of 5.75% and an amortization period of 3 years. (Use 15% HST)

- $32 500 − $9000 = $23 500
- $23 500 × 1.15 = $27 025

Jill needs to borrow $27 025

PERSONAL LOAN PAYMENT CALCULATOR: MONTHLY PAYMENT PER $1000.00 BORROWED (INTEREST COMPOUNDED MONTHLY)

Interest rate (%)	*Term in years*				
	1	*2*	*3*	*4*	*5*
3.00	84.69	42.98	29.08	22.13	17.97
3.25	84.81	43.09	29.19	22.24	18.08
5.00	85.61	43.87	29.97	23.03	18.87
5.25	85.72	43.98	30.08	23.14	18.99
5.50	85.84	44.10	30.20	23.26	19.10
5.75	85.95	44.21	30.31	23.37	19.22
6.00	86.07	44.32	30.42	23.49	19.33
6.25	86.18	44.43	30.54	23.60	19.45
6.50	86.30	44.55	30.65	23.71	19.57
6.75	86.41	44.66	30.76	23.83	19.68
7.00	86.53	44.77	30.88	23.95	19.80

a) What is Jill's monthly payment?

(1) $\frac{27025}{1000} = 27.025$

(11) $30.31 \times 27.025 = \$819.13/\text{month}$

b) Calculate the total amount she will pay over the 3 years. 3 × 12 = 36 months

$819.13 × 36 = $29 488.68

c) Calculate the finance charge on the loan.

$29 488.68 − $27 025.00 = $

- Calculate cost after tax
- Subtract down payment

Zeke is purchasing a motorcycle which costs $24,000.00. He has a down payment of $4400.00. He takes out a personal loan from his local bank at an annual rate of 6% and an amortization period of 4 years. (Use 15% HST)

- $24000 \times 1.15 = 27600$
- $27600 - 4400 = 23200$

He needs to borrow 23200

PERSONAL LOAN PAYMENT CALCULATOR: MONTHLY PAYMENT PER $1000.00 BORROWED (INTEREST COMPOUNDED MONTHLY)

Interest rate (%)	*Term in years*				
	1	*2*	*3*	*4*	*5*
3.00	84.69	42.98	29.08	22.13	17.97
3.25	84.81	43.09	29.19	22.24	18.08
5.00	85.61	43.87	29.97	23.03	18.87
5.25	85.72	43.98	30.08	23.14	18.99
5.50	85.84	44.10	30.20	23.26	19.10
5.75	85.95	44.21	30.31	23.37	19.22
6.00	86.07	44.32	30.42	23.49	19.33
6.25	86.18	44.43	30.54	23.60	19.45
6.50	86.30	44.55	30.65	23.71	19.57
6.75	86.41	44.66	30.76	23.83	19.68
7.00	86.53	44.77	30.88	23.95	19.80

a) What is his monthly payment?

(i) $\frac{23200}{1000} = 23.2$

(ii) $23.49 \times 23.2 = \$544.97$/month

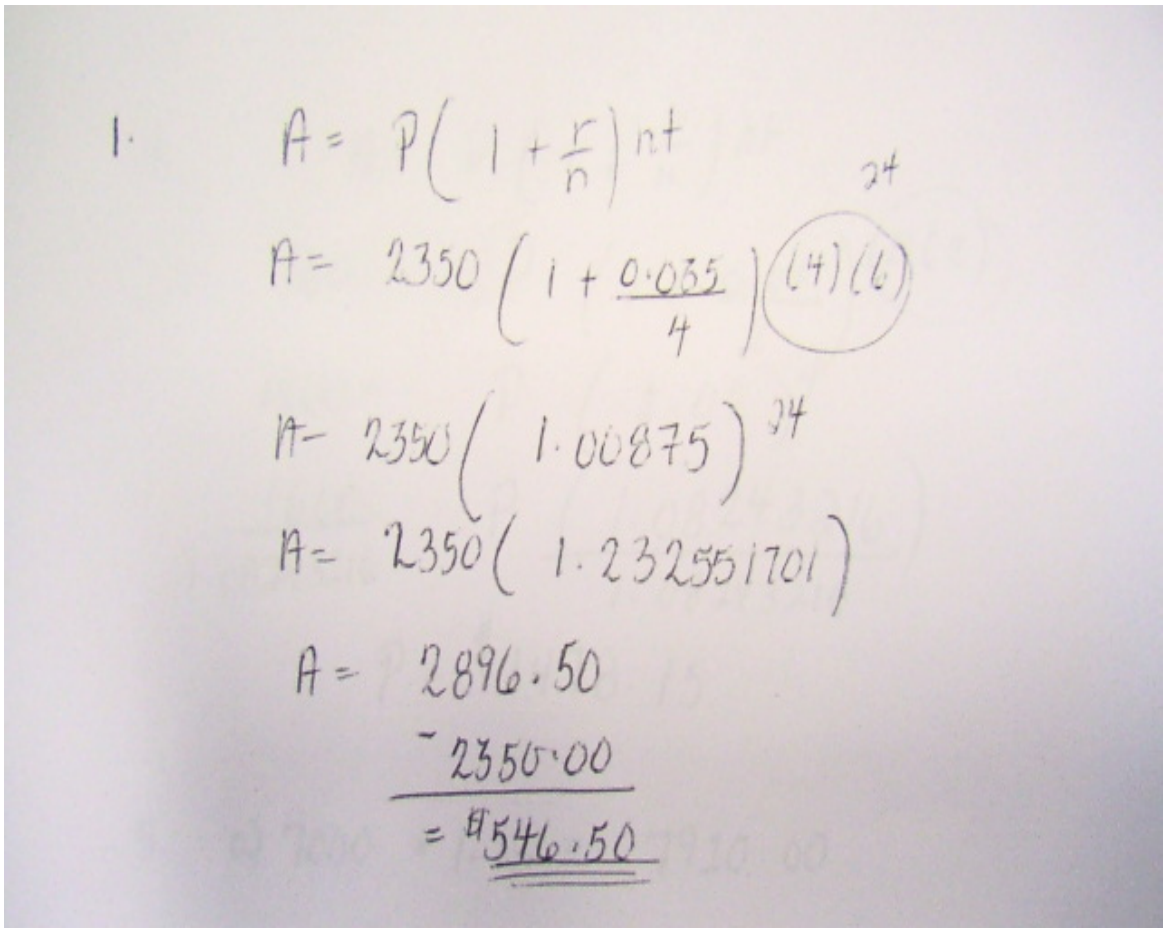
b) Calculate the total amount he will pay over the 4 years. $4 \times 12 = 48$ months

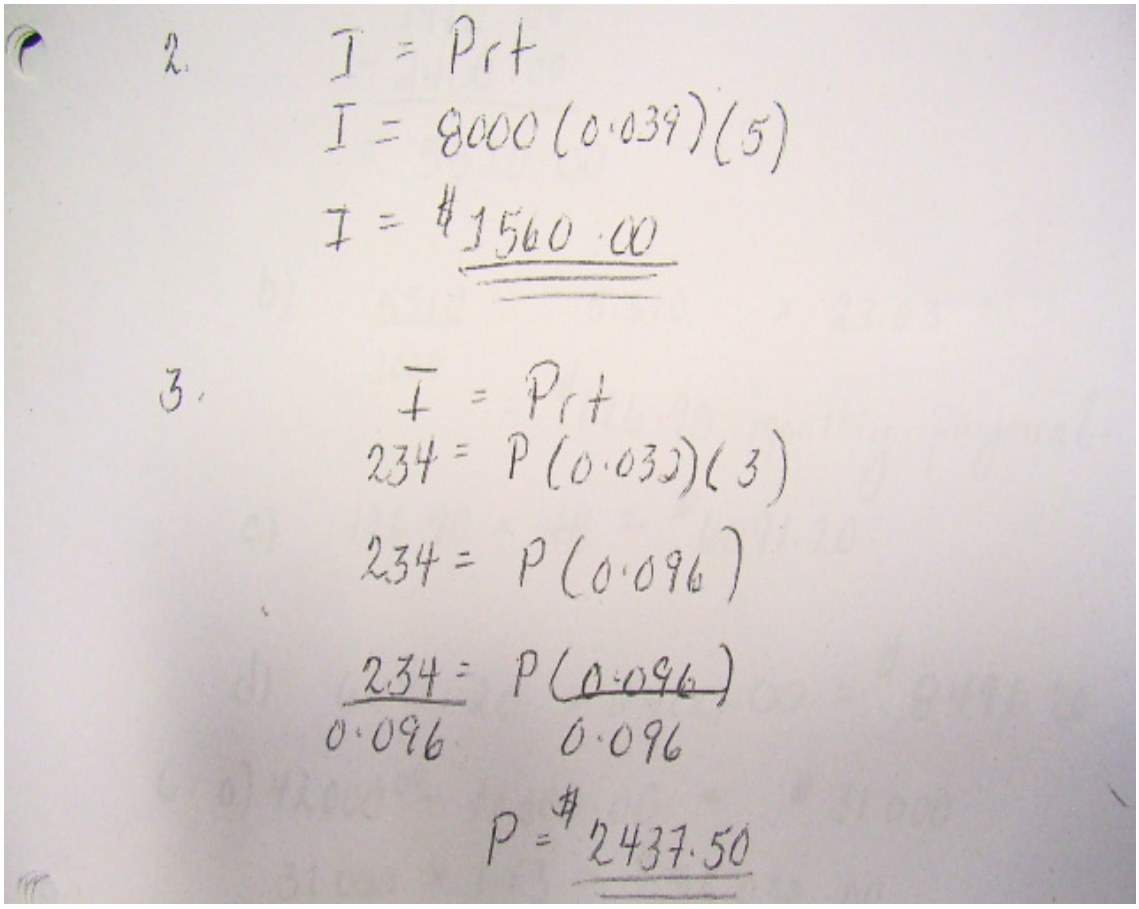
$\$544.97 \times 48 = \$26158.56$

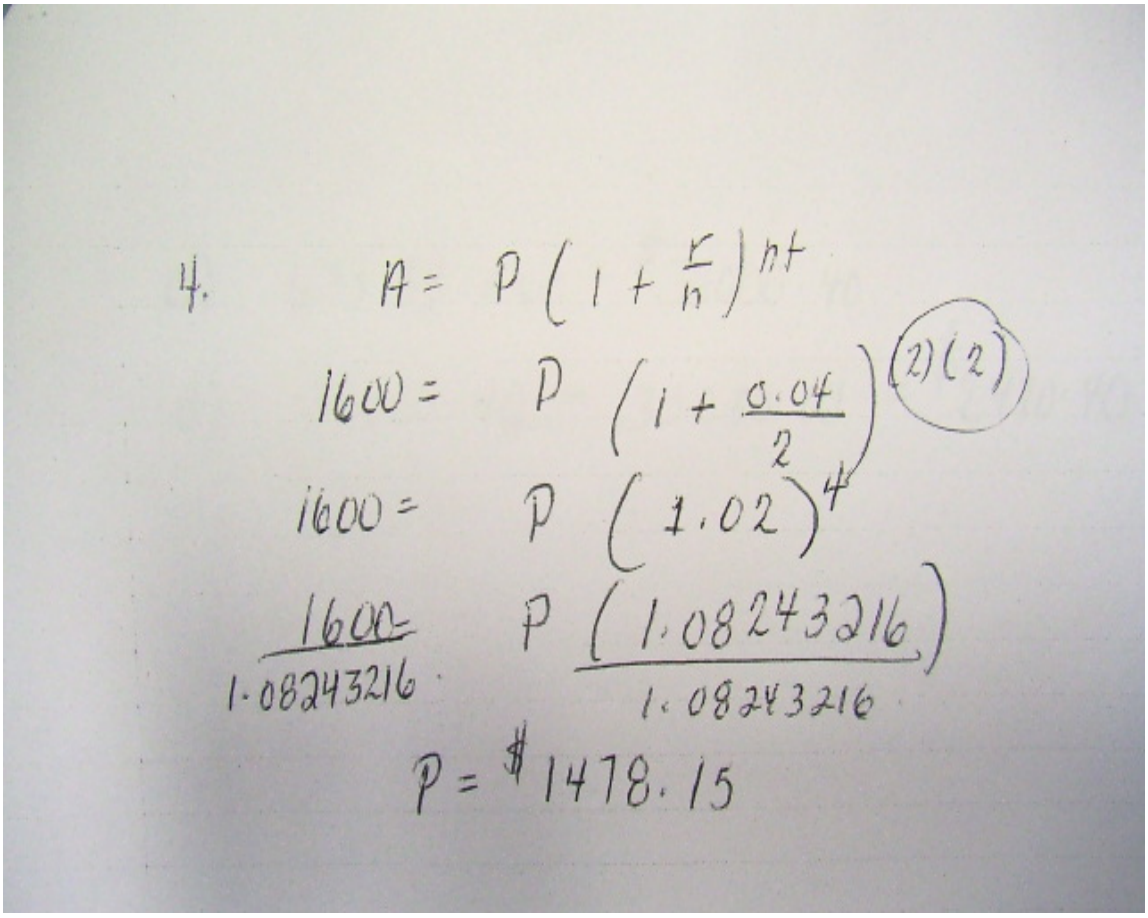
c) Calculate the finance charge on the loan.

$\$26158.56 - \$23200 = \$2958.56$

Homework


1.
A = P(1 + r/n)^nt
24
A = 2350(1 + 0.035/4)^(4)(6)
A = 2350(1.00875)^24
A = 2350(1.232551701)
A = 2896.50
- 2350.00
= $546.50


2.
I = Prt
I = 8000(0.039)(5)
I = $1560.00
3.
I = Prt
234 = P(0.039)(3)
234 = P(0.096)
234 / 0.096 = P(0.096) / 0.096
P = $2437.50


4.
$A = P\left(1 + \frac{r}{n}\right)^{nt}$
$1600 = P\left(1 + \frac{0.04}{2}\right)^{(2)(2)}$
$1600 = P\left(1.02\right)^{4}$
$\frac{1600}{1.08243216} \quad P\frac{(1.08243216)}{1.08243216}$
$P = \$1478.15$

5. a) $7000 \times 1.13 = 7910.00$

7910.00
-2400.00
$= 5510.00$

b) $\frac{5510}{1000} = 5.510 \times 23.03$

$= \$126.90$ monthly payment.

c) $126.90 \times 48 = \$6091.20$

d) $6091.20 + 2400.00 = \$8491.20$

6. a) $42000^{00} - 11000.00 = \$31000$

$31000 \times 1.13 = \$35030.00$

b) $\frac{35030}{1000} = 35.030 \times 18.08 = \$633.34$ monthly Payment

c) $633.34 \times 60 = \$38000.40$

d) $38000.40 - 35030.00 = \$2970.40$