HOMEWORK... Questions?

Page 530: #1, 2, 3, 5, 6

Simple Interest

$$I = \Pr t \qquad A = P + \Pr t$$
$$A = P + I \qquad A = P(1+rt)$$

Compound Interest

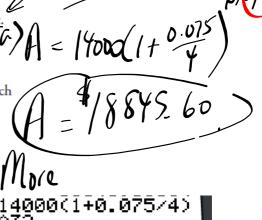$$A = P\left(1+\frac{r}{n}\right)^{nt} \qquad I = A - P$$

Present Value

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

5. Perry's bank has approved a personal loan of $14 000 at 7.5%, compounded quarterly, so that Perry can pave his driveway. Perry wants to repay the loan at the end of 4 years, with a single payment.
   a) How much will Perry need to pay?
   b) For each situation below, predict whether Perry would end up paying more or less than the amount in part a). Explain your prediction. Then verify your prediction by calculating how much more or less.
      i) He took twice the time to repay the loan.
      ii) He paid off the loan in half the time.

← Formula

a) $A = 14000\left(1 + \dfrac{0.075}{4}\right)^{4\times4}$

$A = \$18845.60$

b) i) More

```
14000(1+0.075/4)
^32
          25368.3331
```

ii) Less

```
14000(1+0.075/4)
^8
          16243.10343
```

p. 525

EXAMPLE 4   Solving for the payment and interest of a loan
with regular payments

Jose is negotiating with his bank for a **mortgage** on a house. He has been told that he needs to make a 10% down payment on the purchase price of $225 000. Then the bank will offer a mortgage loan for the balance at 3.75%, compounded semi-annually, with a term of 20 years and with monthly mortgage payments.
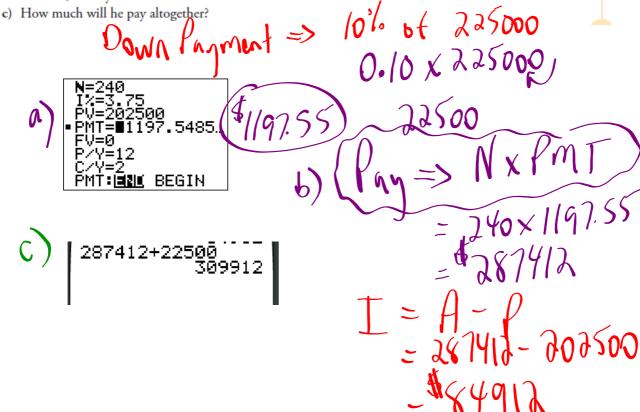
mortgage
A loan usually for the purchase of real estate, with the real estate purchased used as collateral to secure the loan.

collateral
An asset that is held as security against the repayment of a loan.

a) How much will each payment be?
b) How much interest will Jose end up paying by the time he has paid off the loan, in 20 years?
c) How much will he pay altogether?

Down Payment ⟹ 10% of 225000
0.10 × 225000
22500

a)
```
N=240
I%=3.75
PV=202500
▪PMT=▮1197.5485.
FV=0
P/Y=12
C/Y=2
PMT:END BEGIN
```
$1197.55

b) Pay ⟹ N × PMT
= 240 × 1197.55
= $287412

$I = A - P$
= 287412 - 202500
= $84912

c)
```
287412+22500
        309912
```
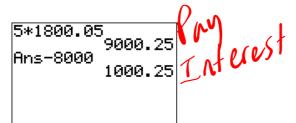
p. 527

| EXAMPLE 5 | Relating payment and compounding frequency to interest charged |

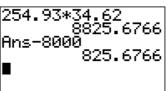Bill has been offered the following two loan options for borrowing $8000. What advice would you give?

Option A: He can borrow at 4.06% interest, compounded annually, and pay off the loan in payments of $1800.05 at the end of each year.

Option B: He can borrow at 4.06% interest, compounded weekly, and pay off the loan in payments of $34.62 at the end of each week.

Ⓐ   5yrs

$$\frac{255}{52} = 4.9 \text{ years}$$

Ⓑ

```
•N=4.99999 602
 I%=4.06
 PV=8000
 PMT=-1800.05
 FV=0
 P/Y=1
 C/Y=1
 PMT:END BEGIN
```

```
•N=254.9298735
 I%=4.06
 PV=8000
 PMT=-34.62
 FV=0
 P/Y=52
 C/Y=52
 PMT:END BEGIN
```

```
5*1800.05
           9000.25
Ans-8000
           1000.25
```
Pay Interest

```
254.93*34.62
           8825.6766
Ans-8000
           825.6766
■
```
Pay Interest

HOMEWORK...

p. 530:   #4, #7-10, 13, 15, 16, 17

```
N=total # of payments [compounded x term]
I%= interest rate [enter as a %]
PV=loan amount [subtract down payment if given]
PMT=payment amount [negative #]
FV= set equal to zero...pay loan off after end of term
P/Y=number of payments per year
C/Y= compounding period per year
PMT:END  BEGIN
```