HOMEWORK...
Questions?

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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

$$P = \frac{A}{\left(1 + \dfrac{r}{n}\right)^{nt}}$$
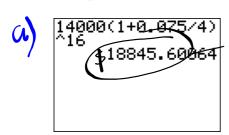
$$4 \times \frac{18}{12} \quad 6$$

3. Matt is laying new floors in three rooms of his house and needs a loan that he will not have to pay back for 18 months. The interest rate for the loan is 4.9%, compounded quarterly. On the maturity date, Matt wants to make a single payment of no more than $12 000. **? P = ?**
   a) What is the most that Matt can borrow?
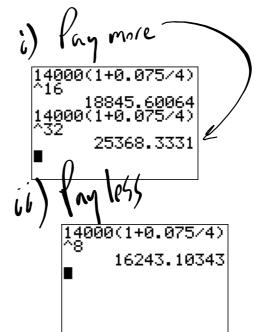   b) How much interest will Matt pay on his loan?

a) $$P = \frac{12000}{\left(1 + \dfrac{0.049}{4}\right)^{4 \times \frac{18}{12}}}$$

$$P = $$

```
12000/(1+0.049/4
)^6
      11154.61367
■
```

b) $$I = 12000 - 11154.6$$
$$I = \$845.39$$

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.

a)
```
14000(1+0.075/4)
^16
        $18845.60064
```

b) i) Pay more
```
14000(1+0.075/4)
^16
        18845.60064
14000(1+0.075/4)
^32
        25368.3331
∎
```

ii) Pay less
```
14000(1+0.075/4)
^8
        16243.10343
∎
```

APP

LOAN ✗
FV = 0 ✗

```
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
```

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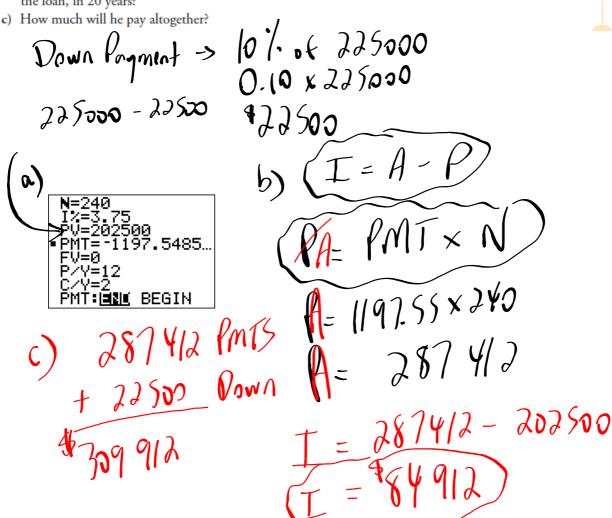
a) How much will each payment be?
b) How much interest will Jose end up paying by the time he has paid off the loan, in 20 years?
c) How much will he pay altogether?

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.

APP

Down Payment → 10% of 225000
0.10 × 225000
$22500

225000 − 22500

a)

```
N=240
I%=3.75
PV=202500
PMT=-1197.5485...
FV=0
P/Y=12
C/Y=2
PMT:END BEGIN
```

b) $I = A - P$

$A = PMT \times N$

$A = 1197.55 \times 240$

$A = 287 412$

$I = 287412 - 202500$

$I = \$84 912$

c) 287 412 PMTS
+ 22 500 Down
$309 912

HOMEWORK...

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