

1. Match the definitions

- $\begin{matrix} d \\ e \end{matrix}$  mortgage loan insurance  
 $\begin{matrix} a \\ b \end{matrix}$  amortization period  
 $\begin{matrix} b \\ c \end{matrix}$  variable interest rate  
 $\begin{matrix} c \\ e \end{matrix}$  mortgage term

It is a type of loan used to buy a home or other property	e
If your down payment is less than 20%, you have to buy	a
It is the length of time that the mortgage agreement at your agreed interest rate is in effect	c
It is the length of time it will take to fully pay off the amount of the mortgage loan	d
The interest rate can change during the mortgage term	b

2. Convert the following non-monthly expenses to **MONTHLY** expenses:

Annual Internet/Cable bill of \$1320 $1320 \div 12 = \$110$	Semi-annual Property Taxes \$1200 $1200 \div 6 = \$200$
Semi-monthly house insurance of \$50 $50 \times 2 = \$100$	Weekly laundry expense of \$16 $16 \times 52 \div 12 = \$69.33$
Quarterly Water/Sewer bill of \$105 (equal billing) $105 \div 3 = \$35$	Bi-weekly mortgage payment of \$800 $800 \times 26 \div 12 = \$1733.33$

3. Joshua has just gotten a job as a mechanic. He estimates his annual income before deductions will be \$52000. His deductions are 35% of his salary. He is currently living at home, but wants to know if he can afford to move out on his own. He has found a furnished bachelor's apartment that would cost \$1400 every month, water and heating included.
- He estimates he will spend \$300 on food, \$40 on phone and \$55 on internet every month.
  - He will have to do laundry every week at a nearby laundromat that costs \$10 weekly.
  - His transportation costs are currently \$4200 for the year, and will stay the same in his new place.
  - He wants to save \$7200 by the end of one year.

Prepare a personal monthly budget for Joshua, and **determine** whether he can afford to move out.

INCOME	
Net Pay	\$2816.67
<b>Total Monthly Income</b>	
EXPENSES	
Rent	\$1400.00
Food	\$300.00
Phone	\$40.00
Wifi	\$55.00
Laundry	\$43.33
Trans	\$350.00
Savings	\$600.00
<b>Total Monthly Expenses</b>	<b>\$2788.33</b>
<b>INCOME - EXPENSES</b>	<b>\$28.34</b>

$Net\ annual = 52000 \times 65\%$   
 $= \$33800$   
 $Net\ monthly = \$2816.67$   
 $Laundry = 10 \times 52 \div 12$   
 $= 43.33$   
 $Trans = 4200 \div 12$   
 $= 350$   
 $Savings = 7200 \div 12$   
 $= 600$

$\therefore$  Joshua will have extra \$28.34 every month; therefore, he can move out.

FUTURE VALUE

Use to find the value at the end of an annuity (after all deposits are made & interest is accrued)

$$A = \frac{R[(1+i)^n - 1]}{i}$$

PRESENT VALUE

Use to find the money needed at the beginning of an annuity to provide regular annuity payments

$$PV = \frac{R[1 - (1+i)^{-n}]}{i}$$

4. Clayton deposits \$500 every 3 months into his daughter's RESP (Registered Education Savings Plan). If the account earns 2.7% / a, compounded quarterly, how much will be in the account after 10 years?

Lump sum is at the end FV  
Type: compounded quarterly  
A: ?  
R: \$500  
i: 2.7%/year ÷ 4 = 0.00675  
n: 10 years × 4 = 40

$$A = \frac{R[(1+i)^n - 1]}{i} = \frac{500[(1+0.00675)^{40} - 1]}{0.00675} = 22872.34$$

∴ Clayton will have \$22,872.34 for his kid's education in 10 years.

5. Wolf is setting up an income fund for his retirement. He wishes to receive \$2200 every month for the next 20 years, starting 1 month from now. The income fund pays 3.1% per year compounded monthly. How much must Wolf deposit now to be able to receive the desired amount every month?

Lump sum required at the beginning PV  
Type: compounded monthly  
PV: ?  
R: \$2200  
i: 3.1%/year ÷ 12 = 0.002583  
n: 20 years × 12 = 240

$$PV = \frac{R[1 - (1+i)^{-n}]}{i} = \frac{2200[1 - (1+0.002583)^{-240}]}{0.002583} = 393140.23$$

∴ Wolf has to deposit \$393,140.23 now.

6. Mickey wants to save up for a \$30,000 in 2 years. How much must she deposit every month into an account that makes 3.72% per year interest compounded monthly, to reach her goal?

Lump sum at the end FV  
Type: comp monthly  
A: \$30,000  
R: ?  
i: 3.72%/year ÷ 12 = 0.0031  
n: 2 years × 12 = 24

$$A = \frac{R[(1+i)^n - 1]}{i}$$

$$30000 = \frac{R[(1+0.0031)^{24} - 1]}{0.0031}$$

put the highlighted numbers into your calculator

$$30000 = R \cdot 24.8754 \quad \text{divide BS by } 24.8754$$

$$R = \$1206.01$$

∴ Mickey must deposit \$1206.01 every month.

7. Mathew borrows now \$30,000 to buy a vehicle. He will repay the loan in equal monthly payments over 5 years, starting 1 month from now. He is charged interest at 5% per year compounded monthly. How much is Mathew's monthly payment?

Lump sum at the beginning, PV  
Type: comp monthly  
PV: \$30,000  
R: ?  
i: 5%/year ÷ 12 = 0.00417  
n: 5 years × 12 = 60

$$PV = \frac{R[1 - (1+i)^{-n}]}{i}$$

$$30000 = \frac{R[1 - (1+0.00417)^{-60}]}{0.00417}$$

$$\frac{30,000}{52.9856} = \frac{R \cdot 52.9856}{52.9856}$$

$$R = \$566.19$$

∴ Mathew will pay \$566.19 every month.