

Finance. Notes.

Basics of Percent:

Percents are the result of expressing numbers as a part of 100.

The word **percent** means per hundred.

Expressing a Decimal as a Percent

Expressing a Percent as a Decimal Number

Percent, Sales Tax, & Discounts

If a quantity changes, its **percent increase** or its **percent decrease** can be found as follows:

1. Find the fraction for the percent increase or decrease:

$$\frac{\text{amount of increase}}{\text{original amount}} \quad \text{or} \quad \frac{\text{amount of decrease}}{\text{original amount}}$$

Income Tax

Income tax is a percentage of your income collected by the government to fund its services and programs.

Calculating Income Tax:

1. Determine your adjusted gross income:

$$\text{Adjusted gross income} = \text{Gross Income} - \text{Adjustment}$$

2. Determine your taxable income:

$$\text{Taxable income} = \text{Adjusted gross income} - (\text{Exemptions} + \text{Deductions})$$

Exemptions: fix amount by IRS Deductions: Standard deduction or Itemized deduction.

3. Determine the income tax:

Income tax: Tax computation - Tax credits

Tax computation is based on tax rates and filing status.

Social Security and Medicare (FICA)

In addition to income tax, we are required to pay the federal government **FICA** (Federal Insurance Contributions Act) taxes that are used for Social Security and Medicare benefits. **Social Security** provides payments to eligible retirees, people with health problems, eligible dependents of deceased persons, and disabled citizens. **Medicare** provides health care coverage mostly to Americans 65 and older.

Employee's Rates	Matching Rates Paid by the Employer	Self-Employed Rates
<ul style="list-style-type: none">• 5.65% on first \$110,000 of income• 1.45% of income in excess of \$110,000	<ul style="list-style-type: none">• 7.65% on first \$110,000 paid in wages• 1.45% of wages paid in excess of \$110,000	<ul style="list-style-type: none">• 13.3% on first \$110,000 of net profits• 2.9% of net profits in excess of \$110,000

Compound Interest

Compound interest is interest computed on the original principal as well as on any accumulated interest.

To calculate the compound interest paid once a year we use

$$A = P(1 + r)^t,$$

where A is called the account's **future value**, the principal P is called its **present value**, r is the rate, and t is the number of years.

To calculate the compound interest paid more than once a year we use

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

For continuous compounding: $A = Pe^{rt}$. Where e is Euler's number, approx, 2.711828....

The **effective annual yield**, or the **effective rate**, is the *simple interest rate* that produces the same amount of money in an account at the end of one year as when the account is subjected to compound interest at a stated rate.

Annuities, Methods of Saving, and Investments

An *annuity* is a sequence of equal payments made at equal time periods. The *value of an annuity* is the sum of all deposits plus all interest paid.

If P is the deposit made at the end of each year for an annuity that pays an annual interest rate r (in decimal form) compounded once a year, the value, A , of the annuity after t years is

$$A = \frac{P \left[(1 + r)^t - 1 \right]}{r}.$$

If P is the deposit made at the end of each compounding period for an annuity that pays an annual interest rate r (in decimal form) compounded n times per year, the value, A , of the annuity after t years is

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

Investments

When depositing money into a bank account, you are making a *cash investment*.

The account's interest rate guarantees a certain percent increase in your investment, called its *return*.

Other kind of investments that are riskier are called *stocks* and *bonds*.

Stocks

Buying or selling stocks is referred to as *trading*.

Stocks are traded on a *stock exchange*.

There are two ways to make money by investing in stock:

You sell shares for more money than you paid for them, in which case you have a **capital gain** on the sale of stock.

While you own the stock, the company distributes all or part of its profits to shareholders as **dividends**.

Bonds

In order to raise money and dilute the ownership of current stockholders, companies sell **bonds**.

People who buy a bond are *lending money* to the company from which they buy the bond.

Bonds are a commitment from a company to pay the price an investor pays for the bond at the time it was purchased, called the *face value*, along with interest payments at a given rate.

A listing of all the investments that a person holds is called a *financial portfolio*.

Most financial advisors recommend a portfolio with a mixture of low-risk and high-risk investments, called a *diversified portfolio*.

Mortgages

A **mortgage** is a long-term loan for the purpose of buying a home.

The **down payment** is the portion of the sale price of the home that the buyer initially pays to the seller.

The **amount of the mortgage** is the difference between the sale price and the down payment.

Some companies, called **mortgage brokers**, offer to find you a mortgage lender willing to make you a loan.

Fixed-rate mortgages have the same monthly payment during the entire time of the loan.

Variable-rate mortgages known as **adjustable-rate mortgages** (ARMs), have payment amounts that change from time to time depending on changes in the interest rate.

Most lending institutions require the buyer to pay one or more **points** at the time of closing—that is, the time at which the mortgage begins.

A point is a one-time charge that equals 1% of the loan amount.

For example, two points means that the buyer must pay 2% of the loan amount at closing.

A document, called the **Truth-in-Lending Disclosure Statement**, shows the buyer the APR for the mortgage.

In addition, lending institutions can require that part of the monthly payment be deposited into an **escrow account**, an account used by the lender to pay real estate taxes and insurance.

Computation Involved with Buying a Home

The regular payment amount, PMT , required to repay a loan of P dollars paid n times per year over t years at an annual rate r is given by

$$PMT = \frac{P \left(\frac{r}{n} \right)}{\left[1 - \left(1 + \frac{r}{n} \right)^{-nt} \right]}$$

Loan Amortization Schedules

When a loan is paid off through a series of regular payments, it is said to be ***amortized***, which literally means “killed off.”

Although each payment is the same, with each successive payment the interest portion decreases and the principal portion increases.

A document showing important information about the status of the mortgage is called a ***loan amortization schedule***.

What Can You Afford

Here’s the bottom line from most financial advisers:

- Spend no more than 28% of your gross monthly income for your mortgage payment.
- Spend no more than 36% of your gross monthly income for your total monthly debt, including mortgage payments, car payments, credit card bills, student loans, and medical debt.

Formula sheet for test 4

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