



## Real Estate Math:

10 Calculations Every Real Estate Agent Must Know To Succeed in Real Estate

[EZRealEstateMath.com](http://EZRealEstateMath.com)

## LEARNING MATH THE EASY WAY.

Gain a competitive advantage over other agents by mastering a few simple real estate math calculations! This guide covers 10 common calculations you'll need to know as a real estate agent to better serve your clients.

1. Calculating Property Taxes
2. Calculating Commissions
3. Calculating Repair Costs
4. Calculating Purchase Price - Loan Qualification
5. Calculating Purchase Price - Investment Property
6. Calculating Net Proceeds to Seller
7. Calculating Simple Interest
8. Prorating Taxes at Closing
9. Calculating Total Interest Paid on a Loan
10. Calculating Percentage Leases

## 1 Calculating Property Tax

### Definitions

#### Assessed Value

The value of the property for the purposes of the assessment only. This is typically a percentage of the home's actual value.

#### Property Tax Rate

The rate at which the city or county taxes real property annually. This is usually expressed as a dollar amount per thousand dollars.

#### Annual Property Taxes

Every property owner must pay taxes to the city or county they live in. The tax is based on a fixed percentage of the assessed value of the property.

### Formulas

#### Assessed Value =

Property Value x Assessment Percentage

#### Annual Property Taxes =

Assessed Value x Tax Rate

## Calculating Property Taxes

When showing properties in different areas, a buyer may ask you how their property taxes are calculated.

### Question:

Your client wants to buy a property valued at \$100,000. The property is assessed at 85% of its value and the local tax rate is \$42.73 per \$1,000. What is the expected amount of monthly taxes your client will pay?

### Answer:

#### 1. Calculate Assessed Value

$$\$100,000 \times .85 = \$85,000$$

#### 2. Calculate Property Tax Rate

$$\$42.73 / \$1000 = .04273$$

#### 3. Calculate Annual Property Tax

Assessed Value x Tax Rate =

$$\$85,000 \times .04273 = \$3,632.05$$

#### 4. Calculate Monthly Property Tax

$$\$3,632.05 / 12 = \mathbf{\$302.67 \text{ per month}}$$

## Calculating Commissions

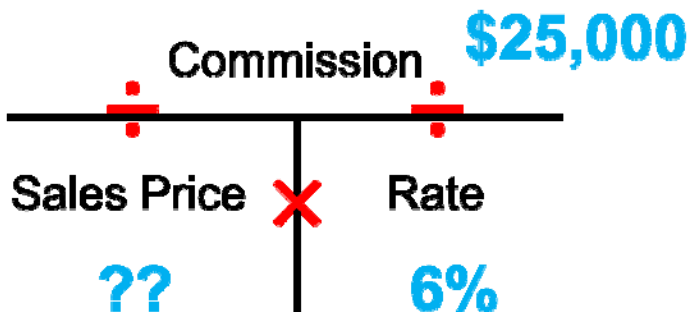
Calculating commissions is important to make sure you get paid the correct amount for every real estate transaction you do!

### Question:

Broker Betty received a commission check for \$25,000. If Betty's commission rate was 6%, what was the sales price of the property?

### Answer:

1. Use the "T" Method



$$\text{Sales Price} = \text{Commission} \div \text{Rate} =$$
$$\$25,000 \div .06 = \$416,667$$

## 2 Calculating Commissions

### Definitions

#### Sales Price

The contract price of the property that is being transferred from the seller to the buyer.

#### Commission

The amount a listing broker is paid by the seller for real estate services. It is usually a percentage (i.e., commission rate) of the sales price.

#### Commission Rate

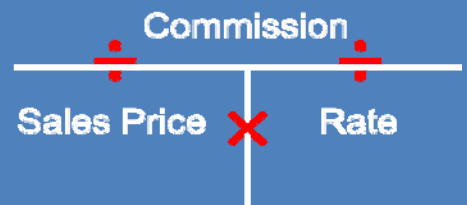
The rate determined in the listing agreement that the seller will pay the listing broker.

#### Broker / Agent Split

The percentage split of the commission that the broker shares with other agents.

### Formulas

Use the "T" Method



## 3 Calculating Areas

### Formulas

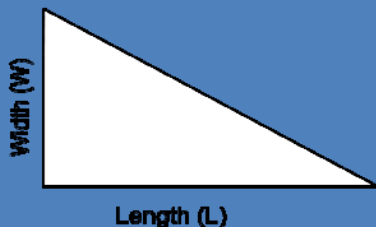
#### Area of a rectangle

$$\text{Length} \times \text{Width}$$



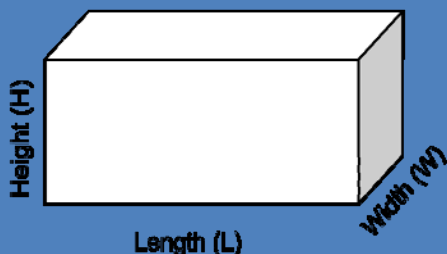
#### Area of a triangle

$$\frac{1}{2} \times \text{Length} \times \text{Width}$$



#### Volume

$$\text{Length} \times \text{Width} \times \text{Height}$$



#### Total Cost =

$$\text{Cost / Unit} \times \# \text{ of Units}$$

## Calculating Repair Costs

Calculating repair costs typically involves calculating lengths, areas, and volumes for parts of a house.

### Question:

David wants to install a 6-inch thick concrete patio on the back of his house. If the patio is 15 feet x 10 feet, how much cubic feet of concrete does he need?

### Answer:

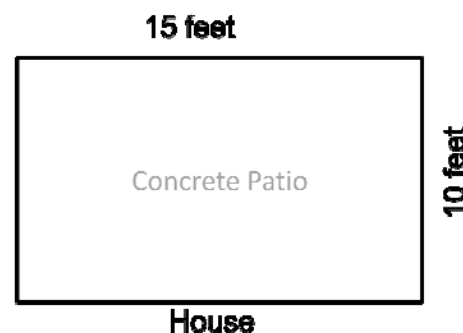
1. Convert to the same units

$$6 \text{ inches} = 0.5 \text{ feet}$$

2. Calculate Volume

$$\text{Volume} = L \times W \times H =$$

$$15 \text{ feet} \times 10 \text{ feet} \times 0.5 \text{ feet} = \mathbf{75 \text{ cubic feet}}$$



### Question:

David decides he wants to put a fence along his patio. ABC Contracting gives him a quote of \$5 per linear foot for materials and labor. What is the cost of the fence?

### Answer:

1. Calculate Number of Linear Feet of Fence Needed.

David needs a fence on 3 sides of the patio:

$$\text{Linear Feet of Fence} = 10 + 15 + 10 = \mathbf{35 \text{ linear feet}}$$

2. Calculate Installation Cost

$$\text{Total Cost} = \$5 / \text{foot} \times 35 \text{ linear feet} = \mathbf{\$175}$$

## Calculating Maximum Purchase Price based on Loan Qualification

Every real estate agent should know how to calculate the maximum purchase price for their client buyer in order to avoid looking at properties they cannot afford.

### Question:

The bank tells your client that the maximum loan amount they can give is \$350,000, assuming your client can put a 20% down payment towards the purchase of the property. What is the maximum purchase price your client can pay? What is the maximum down payment your client needs to pay?

### Answer:

#### 1. Calculate % Loan Amount

$$1 - .20 = .8 = 80\%$$

#### 2. Calculate Purchase Price

$$\$350,000 = 80\% \times \text{Purchase Price}$$

$$\text{Purchase Price} = \$350,000 / .8 = \mathbf{\$437,500}$$

#### 3. Calculate Down Payment

$$\text{Down Payment} = \% \text{ Down Payment} \times \text{Purchase Price}$$

$$.20 \times 437,500 = \mathbf{\$87,500}$$

$$\text{Note that } \$87,500 + \$350,000 = \$437,500$$

## 4 Calculating Purchase Price based on Loan Qualifications

### Definitions

#### Down payment

The amount of cash that a buyer has towards the purchase of a property.

#### Loan Amount

The amount that a buyer must borrow towards the purchase of a property.

#### Discount Points

Used to calculate how much upfront interest a buyer can pay to reduce the interest rate of the loan. Typically, it costs 1% of the loan amount.

### Formulas

$$\text{Purchase Price} =$$

$$\text{Downpayment} + \text{Loan Amount}$$

$$\text{Cost of 1 Discount Point}$$

$$= 1\% \times \text{Loan Amount}$$

$$\% \text{ Downpayment} =$$

$$\text{Downpayment} / \text{Purchase Price}$$

$$\% \text{ Loan Amount} =$$

$$\text{Loan Amount} / \text{Purchase Price}$$

## 5 Calculating Purchase Price for Investment Property

### Definitions

#### Gross Income

The gross amount of annual income coming from rent.

#### Operating Expenses

The annual amount of expenses for a property (e.g., property taxes, repair costs, etc.)

#### Net Operating Income (NOI)

The difference between the Gross Income and Operating Expenses.

**Cap Rate** The rate of return an investor wants to achieve for an investment property.

**Property Value** The value of the investment property, which is calculated based on the NOI and Cap Rate.

### Formulas

**Gross Income =**

# of units x rent/unit x 12 months

**Net Operating Income =**

Gross Income – Operating Expenses

## Determining Purchase Price for Investment Property

Real estate investors use different calculations than residential retail buyers to determine their offer. If you're working with an investor, you should know the criteria they are using to calculate their offer.

### Question:

An investor wants to purchase an 8-unit apartment building that receives \$400/month rent for each unit. The annual operating expense for the apartment building is \$6,500. If the investor wants a 9% return, what should the maximum purchase price of the property be?

### Answer:

#### 1. Calculate Gross Income

$\$400/\text{month} \times 8 \text{ units} \times 12 \text{ months} = \$38,400$

#### 2. Calculate NOI

$\text{NOI} = \$38,400 - \$6,500 = \$31,900$

#### 3. Calculate Maximum Purchase Price

Maximum Purchase Price =

$\$31,900 / .09 = \mathbf{\$354,444}$

## Calculate Net Proceeds to a Seller

Without a doubt, your seller client is going to ask you “So how much am I going to get at closing?” Be prepared to answer that question!

### Question:

A seller agrees to sell his house for \$459,000. His listing agreement indicates he will pay a 5% commission to his broker. He also expects to pay 3% of the purchase price towards closing costs. What is the net proceed the seller can expect at closing?

### Answer:

#### 1. Calculate Commission

$$\text{Commission} = \$459,000 \times .05 = \$22,950$$

#### 2. Calculate Closing Costs

$$\text{Closing Costs} = \$459,000 \times .03 = \$13,770$$

#### 3. Calculate Net Proceeds

Net Proceed =

$$\$459,000 - \$22,950 - \$13,770 = \mathbf{\$422,280}$$

## 6 Calculating Net Proceeds

### Definitions

#### Sales Price

The contract price of the property that is being transferred from the seller to the buyer.

#### Commission

The amount a listing broker is paid by the seller for real estate services.

#### Closing Costs

Miscellaneous costs for transferred real estate that must be paid (e.g., title insurance, transfer fees, etc.)

#### Net Proceeds

The actual net amount of money the seller receives after he pays commission and closing costs.

### Formulas

#### Commission =

$$\% \text{ Commission Rate} \times \text{Purchase Price}$$

#### Closing Costs =

$$\% \text{ Closing Cost Rate} \times \text{Purchase Price}$$

#### Net Proceeds =

$$\text{Purchase Price} - \text{Commission} - \text{Closing Costs}$$

## 7 Calculating Simple Interest

### Definitions

#### Simple Interest

Interest that is calculated on the principal amount only.

#### Principal

The amount your client is borrowing.

#### Interest Rate

The annual rate at which a lender charges for borrowing money. When your client borrows money from a lender, they usually have to pay more than what they borrowed.

#### Total Interest

The total amount over the principal amount that your client needs to pay.

#### Number of Years

Number of Years of the Loan

### Formulas

**Annual Interest =**

Principal x Interest Rate

**Total Interest =**

Annual Interest x Number of Years

**Total Amount Paid =**

Total Interest + Principal

## Calculating Simple Interest

Most of the time, your buyer will need to take a loan out to purchase a property. You should be familiar with basic interest calculations.

### Question:

Your client decides to borrow \$50,000 for 7 years from a lender that charges 5% interest. What is the total interest that your client will pay? What is the total amount your client will pay to the lender?

### Answer:

#### 1. Calculate Annual Interest

$\$50,000 \times .05 = \$2,500$  interest per year

#### 2. Calculate Total Interest

Total interest =  $\$2,500 \times 7$  years = **\$17,500**

#### 3. Calculated Total Amount Paid to Lender

Total Amount =

$\$50,000 + \$17,500 =$  **\$67,500**



## Prorating Taxes at Closing

Settlement statements can be confusing because there are many different credits and deductions taken by both the seller and buyer. Be prepared at closing!

### Question:

In the sale of a residential property, the seller has already paid property taxes for the current year in the amount of \$1,550. If the sale is closing on April 4<sup>th</sup>, how will the taxes be prorated on the HUD-1? (Assume a 30-day month and that the buyer is responsible for payments on the closing date.)

### Answer:

- Determine monthly property tax amount**  
 $\$1,550 / 12 \text{ months} = \$129.17/\text{month}$
- Determine daily property tax amount**  
 $\$129.17 / 30 \text{ days} = \$4.31/\text{day}$
- Determine number of months and days the buyer is responsible for**  
April 4 to April 30 = 26 days  
May to December = 8 months  
The buyer is responsible for 8 months and 26 days of property taxes
- Calculate total property tax buyer is responsible for**  
 $\$129.17 \times 8 \text{ months} = \$1,033.36$   
 $\$4.31 \times 26 \text{ days} = \$112.06$   
Buyer's Total = \$1,145.42  
**\$1,145.42 CREDIT TO SELLER;**  
**\$1,145.42 DEBIT TO BUYER.**

## 8 Prorating Taxes at Closing

### Definitions

#### Credit

A credit is something that was already paid so you get a refund for that amount at settlement.

#### Debit

A debit is something that you still have to pay for at settlement.

#### 30-day month method

This method of prorating expenses assumes a 30-day month for all months.

#### Property Tax Proration

If a seller pays property tax upfront, the seller is owed a credit at closing. The buyer has a debit for the same amount at closing. Essentially, the buyer has to pay the seller for the remaining portion of the property taxes.

### Formulas

**Monthly Property Tax =**

Annual Tax / 12 months

**Daily Property Tax =**

Monthly Tax / 30 days

## 9 Calculating Total Interest Paid

### Definitions

#### Amortization Factor

A factor used to calculate the monthly mortgage payment based on the loan amount. The factor is based on the interest rate and length of the loan. Amortization factor tables are available at [www.ezrealestatemath.com](http://www.ezrealestatemath.com)

#### Interest

The amount of additional money over the principal amount you must pay a lender to borrow money.

### Formulas

#### Monthly Mortgage Payment =

Amortization Factor x (Loan Amount / 1000)

#### Total Payment =

Monthly Mortgage Payment x Number of Monthly Payments

#### Total Interest =

Total Payment – Loan Amount

## Calculating Total Interest Paid

Your buyer client may have questions about how much their loan is really going to cost and how to determine how much interest they will end up paying.

### Question:

How much total interest is paid on a \$200,000 loan amortized over 30 years at 5% interest, using a factor of \$5.37 per thousand?

### Answer:

**1. Calculate monthly mortgage payment**

$$5.37 \times (\$200,000 / \$1,000) = \$1,074$$

**2. Calculate total payment**

$$30 \text{ years} = 360 \text{ months}$$

$$\text{Total Payments} = \$1,074 \times 360 = \$386,640$$

**3. Calculate total interest**

$$\text{Total Interest} =$$

$$\$386,640 - \$200,000 = \mathbf{\$186,640}$$

## Prorating Taxes at Closing

Commercial leases are set up differently than residential leases. You should be familiar with how commercial rent will be calculated.

### Question:

Books R Us signed a percentage lease with a landlord. Books R Us agreed to pay 2% of gross sales plus rent of \$1,450. Last month, Books R Us made \$25,000 in gross sales. How much rent must they pay?

### Answer:

1. Determine monthly rent based on percentage

$$\text{Rent} = 2\% \times \$25,000 = \$500$$

2. Determine total rent

$$\text{Total Rent} = \$1,450 + \$500 = \$1,950$$

### Question:

Gina's Café agrees to pay a their landlord rent of 5% of all sales over \$20,000. Last month, Gina's Café had sales of \$80,000. How much rent must they pay?

### Answer:

1. Calculate sales amount for rent

Gina's Café only pays rent on the amount over \$20,000 →  $\$80,000 - \$20,000 = \$60,000$

2. Determine monthly rent based on percentage

$$\text{Rent} = 5\% \times (\$60,000) = \mathbf{\$3,000}$$

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## Calculating Percentage Leases

### Definitions

#### Percentage Lease

A percentage lease is when a tenant pays rent based on the percentage of sales. Sometimes there is an additional monthly rent charged.

### Formulas

$$\text{Rent} =$$

$$\% \text{ Lease} \times \text{Sales} + \text{Fixed Rent}$$