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Illinois Real Estate Math Formula Sheet

Formulas, units, setup checks, and worked broker-exam examples

Current source	PSI Illinois Real Estate Candidate Information Bulletin, published June 24, 2026
Facts reviewed	August 1, 2026
Use	Broker examination study planning. The current PSI bulletin controls if it changes.

The four-line setup

1	What is the unknown? Write it with the unit.
2	Which values are given, and are their units compatible?
3	Which formula connects those values to the unknown?
4	Does the result have the right direction, size, money format, and rounding?

Property, area, and transaction formulas

Find	Formula	Unit or warning
Rectangle area	length x width	square feet or other squared unit
Triangle area	base x height / 2	use perpendicular height
Acres	square feet / 43,560	1 acre = 43,560 square feet
Square miles	acres / 640	1 square mile = 640 acres
Commission amount	sale price x commission rate	compensation is negotiable
Broker share	amount received x agreed share	follow the stated split order
Seller net	seller credits - seller debits	use the question's closing statement
Buyer cash needed	buyer debits - buyer credits	deposit and loan usually reduce cash due
Proration	period amount / period days x chargeable days	use 360, 365, or actual days as stated

Financing and valuation formulas

Find	Formula	Setup note
Loan-to-value	loan amount / property value	convert decimal to percent
Loan amount	value x LTV	use lender's stated value basis
Down payment	purchase price - loan amount	not the same as closing cash
Point cost	loan amount x point percentage	1 point = 1% of the loan
Simple interest	principal x annual rate x time	express time in years
PITI	principal + interest + taxes + insurance	use monthly components when asked monthly
NOI	effective gross income - operating expenses	exclude debt service from cap-rate NOI
Capitalization rate	NOI / value	income and value periods must align
Value by cap rate	NOI / cap rate	convert percentage to decimal
GRM	sale price / gross monthly rent	GRM does not subtract expenses
Value by GRM	gross monthly rent x GRM	use comparable market GRM
Appreciation amount	original value x rate	for one stated period
New value	original value + change	subtract depreciation or loss

Formula triangle prompts

Commission: amount = price x rate | price = amount / rate | rate = amount / price

Capitalization: NOI = value x rate | value = NOI / rate | rate = NOI / value

LTV: loan = value x LTV | value = loan / LTV | LTV = loan / value

Worked setup checks

Example 1: loan, down payment, and points

A buyer pays $385,000, uses an 80% LTV loan, and pays 2 points. Loan = $385,000 x 0.80 = $308,000. Down payment = $385,000 - $308,000 = $77,000. Points = $308,000 x 0.02 = $6,160. Points are based on the loan, not the price.

Example 2: capitalization

Effective gross income is $96,000 and operating expenses are $36,000. NOI = $60,000. At an 8% capitalization rate, indicated value = $60,000 / 0.08 = $750,000. Mortgage payments are not subtracted as an operating expense in this setup.

Example 3: proration

A question gives a $7,200 annual item, a 360-day year, and 105 chargeable days. Daily amount = $7,200 / 360 = $20. Proration = $20 x 105 = $2,100. Decide debit and credit only after identifying who owes the item and whether it is paid in advance or arrears.

Illinois transfer-tax unit

State tax = round taxable value / $500 up to the next whole unit, then multiply by $0.50. For $327,250: 654.5 becomes 655 units; state tax = 655 x $0.50 = $327.50. A county may impose $0.25 per $500, and home-rule municipalities may impose additional tax. Use the rate and payer stated in the question.

Last-minute error scan

- Convert percent to decimal before multiplying or dividing.
- Do not use the sale price when the formula calls for the loan amount, NOI, or taxable value.
- Round only where the question, tax unit, or money format requires it.
- Label debit and credit after determining timing and responsibility.

Primary sources

PSI Illinois Real Estate Candidate Information Bulletin, June 24, 2026: https://test-takers.psiexams.com/api/content/bulletin/6251

Illinois Department of Revenue real estate transfer tax: https://tax.illinois.gov/research/taxinformation/property/realestate.html

35 ILCS 200/31-10: https://www.ilga.gov/Documents/legislation/ilcs/documents/003502000K31-10.htm