

## RE 618 / Fin 618 – Real Estate Investment Analysis

### Valuation Fundamentals – Practice Problems – Solutions

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- 1) Trent is considering investing in a commercial office building in east Wichita. The building has 120,000 square feet of gross leasable area. Of this, 35,000 square feet rent for \$17.50 per square foot (psf), 65,000 square feet rent for \$16.00 psf, while the remaining 20,000 square feet rent for \$15.25 psf. All leases in this building are gross leases. Currently, the average vacancy rate for similar office space in east Wichita is 12%. The asking price for this property is \$10 million.

Based on the prior owner's past tax returns, Trent has forecasted the following expenses for the property:

Depreciation allowances	205,000
Utilities	\$195,170
Maintenance	185,000
Management expenses	10% of EGI
Mortgage interest	220,000
Property insurance	135,000
Property taxes	260,000

- a) Write out the pro forma operating statement for this property. What is its expected net operating income?

Potential gross income		
35,000 @ 17.50	\$612,500	
65,000 @ 16.00	1,040,000	
20,000 @ 15.25	305,000	1,957,500
Less: Vacancy & collection		(234,900)
Effective gross income		1,722,600
Operating expenses		
Utilities	195,170	
Maintenance	185,000	
Management expenses	172,260	
Property insurance	135,000	
Property taxes	260,000	(947,430)
Net operating income		775,170

- b) At what cap rate is the seller offering this property?

$$r = \text{NOI} / V = 775,170 / 10,000,000 = 0.0775 = 7.75 \text{ percent.}$$

- c) Similar office buildings have recently been selling at an 8.50 percent cap rate. Based solely on a comparison of cap rates, does this appear to be a good investment at the current asking price? Explain.

Based solely on its cap rate, this does not appear to be a good investment. For the price you must pay, the income it is generating annually is relatively low compared to other office properties in the market. In other words, if you purchased a different office building in the market you could obtain more than \$775,170 in annual income for your \$10 million investment.

- d) Provide two specific reasons why the cap rate may be a misleading indicator of a property's true value as an investment. That is, what factors might cause you to change your answer in part (c) above?

Cap rates only consider first year net operating income. If the income generated by this property is expected to grow at a faster rate than other properties in the market, it could sell for a lower cap rate.

In addition, cap rates do not fully account for a property's risk. If this building is in a superior location with high-credit tenants committed to long-term leases, then this property might also command a higher than typical price (e.g., a lower cap rate).

- e) If Trent were to buy this property at an 8.50 percent cap rate, what price would he pay?

To obtain an 8.50 percent cap rate, you would need to purchase the property at  $V = NOI / r = 775,170 / 0.085 = \$9,119,647$ , or just over \$9.1 million.

- 2) Mr. Buyer is thinking of buying an apartment complex that is offered for sale by R.E. Sellers, Inc. The asking price is \$3.25 million. The following statement of income and expense is presented for Mr. Buyer's consideration.

<b>The Valleyridge Apartments</b>		
<b>Prior Year's Operating Results</b>		
<b>Presented by Sellers, Inc., Brokers</b>		
60 units, all two-bedroom apartments, \$675 per month		\$ 486,000
Laundry room and vending machines		<u>15,000</u>
Gross annual income		\$ 501,000
<i>Less Operating Expenses</i>		
Manager's salary	\$ 22,000	
Maintenance staff (one person, part-time)	11,500	
Landscape maintenance	2,800	
Property taxes	<u>23,500</u>	<u>59,800</u>
Net Operating Income		\$441,200

By checking the electric meters during an inspection tour of the property, Buyer determines the occupancy rate to be about 85%. He learns by talking to tenants that most have been offered inducements such as a month's free rent or special decorating allowances. A check with competing apartment houses reveals that similar apartment units rent for about \$625 per month and that vacancies average about 5%. Moreover, these other apartments have pools and recreation areas that make their units worth about \$25 per month more than those of Valleyridge, which has neither.

The tax assessor states that the apartments were reassessed 12 months ago, and that taxes in the coming year will be \$45,400.

Buyer learns that the resident manager at Valleyridge, in addition to a \$22,000 salary, gets a free apartment for her services. He also discovers other expenses: insurance will cost \$6.50 per \$1,000 of coverage, based on estimated replacement cost of \$2.2 million; workers' compensation (\$140 per year) must be paid to the state; utilities, incurred to light hallways and other common areas, cost about \$195 per month for similar properties; supplies and miscellaneous expenses typically run about 0.25% of effective gross income. Professional property management fees in the market are typically are about 5% of effective gross income.

- a) Calculate the cap rate on this property based on the selling price and the NOI figures provided by the seller's broker.

$$R = \frac{\$441,200}{\$3,250,000} = 13.57\% .$$

- b) Develop a pro forma operating statement for the coming year assuming that typically competent, professional management will allow the property to perform based on current market conditions. Based on this pro forma and the current asking price, determine the going-in capitalization rate. How does this compare to the cap rate based on the selling broker's pro forma? Explain why this difference exists.

The pro forma is presented in the accompanying spreadsheet.

Several points are worth noting on this spreadsheet.

- Potential gross rents are calculated using *market* rents, not those listed on the owner's operating statement. This should be clear by the use of inducements and the survey of competitive apartment units.
- I have included laundry room and vending machines as other income affected by vacancy, because these revenues are likely to be positively correlated with apartment vacancy rates. To get the "potential" number, therefore, I divide the actual prior year figures by 0.85 (the occupancy rate).
- The managers apartment is included in estimates of potential gross rents. However, its value is then deducted as an operating expense when calculating NOI.

The going-in cap rate is  $R = \frac{\$299,059}{\$3,250,000} = 9.20\%$ .

This is lower than the broker's cap rate because it reflects a more realistic picture of what rents and expenses can be expected from this property given current market conditions.

- c) Forecast NOI for Valleyridge Apartments for years two through eight, incorporating the following assumptions:
- Potential gross rent and miscellaneous other income will grow at roughly the same rate as overall inflation, which is expected to be 3.0% per year.
  - Operating expenses other than management fees and property taxes will also grow at the same rate as overall inflation.
  - The market vacancy rate will remain constant over the forecast period.
  - Management fees as a percent of effective gross income will remain constant over the forecast period.
  - Property taxes are reassessed every other year, and are expected to increase by 10% with each revaluation; the next revaluation will affect taxes in year three.

See the accompanying spreadsheet.

- d) Mr. Buyer expects to hold the property for seven years. Calculate the expected reversion value (sale price of the property at the end of his holding period) assuming that he can sell the property using a 10.0% terminal cap rate, the current market cap rate for comparable sales of apartment properties that are seven years older than the subject. If Mr. Buyer has a 13.5% discount rate, what is the most he should be willing to pay for this property?

In this case, the reversion value is  $\$363,213 / 0.10 = \$3,632,132$ . Based on this, the present value of the cash flows from this property will be  $\$2,895,405$ . This is the most Mr. Buyer should be willing to pay.

- e) Now calculate the reversion value and the current market value assuming that the property's value will grow by 3.5% off its current market value (not the asking price). What is your estimate of the property's current market value under this assumption? Assume that the appropriate discount rate is once again 13.5%.

Reversion value =  $\$3,740,680$  and market value =  $\$2,940,141$ .

- 3) Question 5, page 288 in the text. What is the relationship between a discount rate and a capitalization rate?

A discount rate measures the opportunity cost of an investor's funds, and should reflect the return that could be earned elsewhere on an investment of comparable risk. It is used to calculate the present value of cash flows received in the future.

In contrast, a capitalization rate measures the current yield on a real estate investment. Thus, the cap rate is comparable to a earnings-price ratio for stock investments.

In general, the difference between the two will reflect expected appreciation in a property's cash flows over time.

- 4) Question 12, page 288 in the text. What are some potential problems with using a “going-in” capitalization rate that is obtained from previous property sales transactions to value a property being offered for sale today?

First the subject property's income may not be expected to grow at the same rate as previous sales. Second, the cash flows from the subject property may have a different risk profile than comparable sales.

- 5) A Class-B office building in Northeast Wichita has 125,000 square feet of gross leasable area. Current Class-B rents in the area are \$10 per square foot (psf), and the current market vacancy rate is 5 percent. Operating expenses for this building are expected to run at about 40 percent of *effective* gross income. The market cap rate for comparable properties is currently 8.50 percent.

- a) Lay out the pro forma operating statement for this property and calculate its net operating income.

Potential gross income (125,000 × \$10)	\$1,250,000
– Vacancy allowance (5%)	<u>(62,500)</u>
Effective gross income	1,187,500
– Operating expenses (40% of EGI)	<u>(475,000)</u>
Net operating income	712,500

- b) If you purchase this building for \$8,000,000, what is your “going-in” cap rate?

$$R = 712,500 / 8,000,000 = 8.90 \text{ percent}$$

- c) Given that the current market cap rate for similar properties is 8.50 percent, does this appear to be a good investment at this price?

Yes. This property is generating a larger annual cash flow relative to the required investment than are other similar office buildings.

- d) What circumstances might cause your answer to the previous question be different?

This property's income might be expected to grow at a slower pace than others in the market.

This property might entail more risk than others in the market.

- e) What is the indicated value of this property using the current market cap rate?

$$V = 712,500 / 0.085 = \$8,382,353$$

- 6) Problem 4, page 289 in the text: Ajax Investment Company is considering the purchase of land that could be developed into a Class A office project. At the present time, Ajax believes that the site could support a 300,000 rentable square foot project with average rents of \$20 per square foot and operating expenses equal to 40 percent of that amount. It also expects rents to grow at 3 percent indefinitely and believes that Ajax should earn a 12 percent return ( $r$ ) on investment. The building would cost \$100 per square foot to build.

- a) What would the estimated property value *and* land value be under the above assumptions? (Hint: Calculate the building's value at cost; the land value is the residual.)

The total value of the project is \$40 million. Subtracting off the \$30 million construction cost for the building, we see that the land is worth \$10 million.

See the accompanying spreadsheet for detailed calculations.

- b) If rents are suddenly expected to *grow* at 4 percent indefinitely, what would the property value and land value be now? What percentage change in land value would this be relative to the land value in (a)?

The total project value is now \$45 million. All of this increase is attributable to the land, so the land value rises by 50 percent to \$15 million.

See the accompanying spreadsheet for detailed calculations.

- c) If instead of (b), suppose growth in rents are expected to *fall* by 2 percent and rents will grow by only 1 percent because of excessive supply, what would land value be now? What percentage change would this be relative to the land value in (a)? (Hint: The wording in this question is confusing; simply assume that rents grow by 1 percent a year rather than by 3 percent.)

In this case, the total project value would be \$32.728 million, while the land would be worth \$2.728 million (a 72 percent drop in value).

See the accompanying spreadsheet for detailed calculations.

- d) Suppose the land owner is asking \$7,000,000 for the land. *Under assumptions in part (a)* would this project be feasible?

Yes, the project would have a positive net present value of \$3 million.

- e) If the land *must* be acquired for \$7,000,000, return to the assumptions in (a), how much of a change in the following would have to occur to make the project feasible? (Consider each item one at a time and hold all other variables constant.) (Hint: If the project is already feasible, by how much could the assumptions below change for the project to still be feasible?)

- Expected return on investment ( $r$ )

Using the Backsolver Add-in in Excel, I obtained a maximum discount rate of 12.73 percent.

- Expected ( $g$ ) or growth in cash flows

Using the Backsolver Add-in in Excel, I obtained a minimum growth in cash flows of 2.27 percent per year.

- Building cost

Building costs can rise to \$110 per square foot and this project will still be feasible.

- Rents (initial base rents)

Initial base rents can fall to \$18.50 per square foot and the project will still be feasible.

7) Problem 6, page 290 in the text: Athena Investment Company is considering the purchase of an office property. After a careful review of the market and leases that are in place, Athena believes that next year's cash flow will be \$100,000. It also believes that the cash flow will rise in the amount of \$5,000 each year for the foreseeable future. It plans to own the property for at least 10 years. Based on a review of property sales of properties that are *now* 10 years older than the subject property, Athena has determined that cap rates are in the range of 0.10. Athena believes that it should earn an *IRR* (required return) of at least 11 percent.

a) What is the estimated value of this office property (assume a 0.10 terminal cap rate)?

The estimated value of this property is \$1.225 million.

See the accompanying spreadsheet for detailed calculations.

b) What is the current, or going-in, cap rate for this property?

The going-in cap rate for this property is  $R = 100,000 / 1,225,000 = 8.16$  percent.

c) What accounts for the difference between the cap rate in (b) and the 0.10 terminal cap rate?

The difference between the cap rate in (b) and the 10 percent terminal rate reflects the fact that properties age and deteriorate over time, commanding lower rents and requiring larger maintenance expenses. As a result, they are less able to produce income. All else equal, a new property should trade at a lower cap rate than an otherwise similar, but older, property.

d) What assumptions are being made regarding future economic conditions when using current comparable sales to estimate terminal cap rates?

The analyst is assuming that supply and demand conditions and market interest rates will be roughly the same ten years from now for the subject property as they are today for the comparables.

- 8) You are considering purchasing a commercial office building for \$2.4 million. The building's first-year expected pro forma looks as follows:

PGI	503,500
<u>- V&amp;C</u>	<u>60,420</u>
EGI	443,080
<u>- OE</u>	<u>155,078</u>
NOI	288,002

- a) Calculate the cap rate for this property. If market cap rates for similar office properties are currently at 11 percent, is this property selling at a high, low, or typical price compared to the market? What would you pay for this property if it were to sell at an 11 percent cap rate? Explain briefly why the property might be fairly priced at a 12 percent cap rate even if other properties are selling at 11.

$$r = 288,002 / 2,400,000 = 12 \text{ percent.}$$

If similar properties are trading at an 11 percent cap rate, this would appear to be a cheap building. If you were to buy the building at an 11 percent cap, you would pay  $288,002 / 0.11 = \$2,618,200$ .

This property still might be fairly priced if it is somehow inferior to other comparable office properties. For example, if the property is expected to require extra maintenance or if the rents of its current tenants are above market and the leases are expected to expire soon, then it would not be able to trade at a market cap rate.

- b) Calculate the gross rent multiplier, the gross income multiplier, the net income multiplier, and the operating expense ratio for this property.

$$\text{GRM} = 2,400,000 / (503,500 / 12) = 57.20.$$

$$\text{GIM} = 2,400,000 / 443,080 = 5.42.$$

$$\text{NIM} = 2,400,000 / 288,002 = 8.33.$$

$$\text{OER} = 155,078 / 443,080 = 0.350 = 35.0 \text{ percent.}$$

- c) Suppose that you can obtain 70 percent loan-to-value ratio financing on this property at 7.75 percent amortized over 30 years with monthly payments. Calculate the annual debt service on this loan. Also calculate the breakeven ratio, the debt coverage ratio, and the cash-on-cash return for this property.

First calculate the monthly payment on this mortgage. With a 70 percent LTV ratio, the loan amount will be  $PV = 1,680,000$ . Next enter  $P/Y = 12$ ,  $N = 360$ ,  $I = 7.75$ , and  $FV = 0$ . Solve for  $PMT = -12,035.73$ . This is the monthly payment, so you must multiply it by 12 to get  $ADS = 12,036 \times 12 = 144,429$ .

$$\text{BER} = (144,429 + 155,078) / 443,080 = 0.676 = 67.6 \text{ percent.}$$

$$\text{DCR} = 288,002 / 144,429 = 1.99.$$

$$\text{COCR} = \text{EDR} = (288,002 - 144,429) / (2,400,000 - 1,680,000) = 0.199 = 19.9 \text{ percent.}$$

9) Alquest Properties is analyzing a commercial office building with the following characteristics:

- The building has 35,000 square feet gross leasable area; 20,000 square feet of this space rents for \$24.00 psf, 10,000 square feet for \$25.00 psf, and 5,000 for \$28.00 psf.
- The current market vacancy rate for comparable office space is 12 percent.
- A typical operating expense ratio for comparable buildings is 55 percent.
- The property can be purchased for \$3.828 million.

a) Write out the pro forma operating statement for this property. What is the building's net operating income?

The pro forma for this building is as follows:

PGI	\$870,000
- V&C	<u>104,400</u>
EGI	765,600
- OE	<u>421,080</u>
NOI	\$344,520

b) At what cap rate is this property being offered?

$$r = 344,520 / 3,828,000 = 0.09.$$

c) What price would Alquest pay if it purchased this property at a 9.50 percent cap rate?

$$P = 344,520 / 0.095 = \$3,626,526.$$

10) Aramis Investments, LLC is considering the purchase of Eastgrove Apartments. Current rent rolls indicate the following for Eastgrove:

Unit Size	Number of Units	Monthly Rent	Number Occupied
1 BR	15	\$425	11
2 BR	50	\$575	47
3 BR	35	\$700	35

An analysis of the apartment market suggests that these rents are competitive and that market rents are expected to increase by 5 percent per year for the indefinite future. The average vacancy rate in the market is currently 10 percent.

In addition to rents, Eastgrove generated \$75,000 in income from vending, covered parking, and other miscellaneous sources. As with rents, this income is expected to increase by 5 percent per year indefinitely. This miscellaneous income is considered to be dependent on occupancy.

Operating expenses include \$145,000 in salaries and benefits for employees, \$125,000 in property taxes, and \$75,250 for repairs and maintenance. Operating expenses are expected to increase by 4 percent per year.

The asking price for this property is \$4.75 million.

- a) Write out an operating statement for this property based on its current situation. What is the implied vacancy rate? What is the cap rate for this property?

The current implied vacancy rate is calculated by dividing the current rental income by the potential rental income that would be realized if the property were fully occupied to get the implied occupancy rate; the implied vacancy rate is one minus the occupancy rate.

The implied vacancy rate for this property is therefore  $1 - 674,400/715,500 = 5.74\%$ .

Note that when writing out an operating statement using current or historical data, it is common to skip the “potential lines” and move directly to effective gross income. This is because vacancies are not being forecasted, but instead are known with certainty. Nevertheless, I have presented a full operating statement here.

Potential rental income		
1 BR units	\$ 76,500	
2 BR units	345,000	
3 BR units	294,000	715,500
Other income (potential) <sup>1</sup>		<u>79,571</u>
Potential gross income		795,071
Vacancies		
1 BR units	(20,400)	
2 BR units	(20,700)	
Miscellaneous	(4,571)	<u>(45,671)</u>
Effective gross income		749,400
Operating expenses		
Salaries and benefits	(145,000)	
Property taxes	(125,000)	
Maintenance and repairs	(75,250)	<u>(345,250)</u>
Net operating income		\$404,150

Based on this NOI, the cap rate for this property is  $404,150 / 4,750,000 = 8.51\%$ .

- b) What is the gross rent multiplier for this property?

Remember that the gross rent multiplier is based on gross monthly potential rental income. Thus,  $GRM = 4,750,000 / (715,500/12) = 79.77 \approx 80$ .

In some cases, the gross rent multiplier is calculated using effective rental income. In this case,  $GRM$  would be  $4,750,000 / (674,400/12) = 84.52$ .

When making comparisons across properties, make sure you are making comparisons using the same method.

<sup>1</sup> This is calculated as follows. The current implied vacancy rate is  $41,100 / 715,500 = 5.744\%$  (where 41,100 represents the market rents on the vacant units). Thus, the potential “other income” is  $75,000 / (1 - 0.05744) = \$79,571$ . In other words, you gross up the other income based on the current occupancy of the apartment complex to get the potential income from this source.

- c) Create a forecasted first-year pro forma based on current market conditions. What is your cap rate based on this information?

Potential gross income	\$834,825
Vacancies & collection allowance	<u>83,483</u>
Effective gross income	751,342
Operating expenses	<u>(359,060)</u>
Net operating income	\$392,282

Based on this new, projected first-year NOI, the cap rate is  $392,282 / 4,750,000 = 0.0826 \approx 8.25\%$ .

- d) Suppose that market cap rates for similar apartment properties are running at 8.50%. Is this property a good buy at the current asking price? Explain.

Based on market cap rates, it appears that the current asking rate is too high.

- e) How much should you pay for the property in order to ensure an 8.50% cap rate?

Price =  $392,282 / 0.085 = 4,615,082 \approx \$4.615$  million.

- f) Why might the cap rate you calculated in part (c) be a misleading of the investment's true potential?

First, cap rates do not account for the riskiness of the individual project. Although comparing to similar properties in the market does provide some control for risk, it is not perfect. If there is some factor that makes this particular apartment less risky than others in the area, it might still be a good investment. One factor that might suggest this to be the case is that this property has a lower current vacancy rate than the market. Notice that based on current operating data, this property is being offered at an 8.50% cap rate.

The cap rate may also be misleading because it implicitly assume that the NOI for the property is relatively stable. If the rents are expected to increase faster in the future than those for other apartments or if operating expenses are expected to decrease, then the cap rate once again may give a misleading picture of the true return on this investment.

- \_\_\_\_\_ 1. You are considering purchasing an apartment complex that is expected to generate a net cash flow of \$300,000 per year forever into the future. If your current required return for investments of this type is 15 percent, what is the most you should pay for this property?
- A. \$300,000  
**B. \$2 MILLION**  
 C. \$3 million  
 D. \$45,000

- \_\_\_\_\_ 2. An alternative investment is a warehouse property that will generate a net cash flow of \$250,000 next year; this figure is expected to increase by 2 percent per year indefinitely. If you have the same required rate of return of 15 percent, what is the most you should pay for this property?
- A. **\$1.923 MILLION**
  - B. \$2.5 million
  - C. \$1.667 million
  - D. \$37,500
- \_\_\_\_\_ 3. If you purchase the property at this price, what is your going-in cap rate?
- A. 2 percent
  - B. 17 percent
  - C. **13 PERCENT**
  - D. 15 percent
- \_\_\_\_\_ 4. You are considering purchasing an office building with 200,000 square feet of gross leasable area. Similar buildings in the area command rents of \$8 per square foot per year, and the current market vacancy rate is 15 percent. Operating expenses are expected to run about \$400,000 per year. What is this property's expected net operating income?
- A. \$1,600,000
  - B. \$1,360,000
  - C. \$400,000
  - D. **\$960,000**
- \_\_\_\_\_ 5. Real estate space markets are typically segmented by
- A. **PROPERTY TYPE, GEOGRAPHIC LOCATION, AND USE OR QUALITY WITHIN A TYPE.**
  - B. size, geographic location, and investor.
  - C. property type, geographic location, and investor.
  - D. geographic location, investor, and quality.
- \_\_\_\_\_ 6. Center Pointe Shopping Center's net operating income is expected to be \$1.8 million next year; this figure is expected to grow by 3 percent per year for the indefinite future. It can be purchased for \$15 million. What is its current cap rate?
- A. 3 percent
  - B. 9 percent
  - C. **12 PERCENT**
  - D. 15 percent

- \_\_\_\_\_ 7. North Pointe Shopping Center has a first-year expected net operating income of \$2.4 million; this figure is expected to remain constant forever into the future. Assuming that similar shopping centers are currently trading at an 8 percent cap rate, estimate North Pointe's current market value.
- A. \$192,000
  - B. \$2.4 million
  - C. \$30 MILLION**
  - D. \$24 million

- \_\_\_\_\_ 8. Consider a property that is expected to generate net operating income as follows:

Year	NOI
1	180,000
2	200,000
3	250,000
4	250,000
5	300,000

At the end of the fifth year you expect to sell this property for \$3 million. If your discount rate is 12 percent, what is the value of this property to you?

- A. **\$2.529 MILLION**
  - B. \$3 million
  - C. \$2.737 million
  - D. \$2.833 million
- \_\_\_\_\_ 9. You are considering purchasing one of several apartment complexes. In analyzing these properties, you have determined that the current market vacancy rate for apartments is 10 percent, and that operating expenses will run about 45 percent of effective rental income (effective gross income). The first property you are considering has 75 units, each of which rents for \$550 per month. Potential rental income (potential gross income) for this complex is
- A. \$41,250.
  - B. \$49,500.
  - C. \$445,500.
  - D. \$495,000.**
- \_\_\_\_\_ 10. The expected vacancy and collection allowance is
- A. \$4,125.
  - B. \$44,550.
  - C. \$49,500.**
  - D. \$222,750.

- \_\_\_\_\_ 11. An alternative apartment complex is expected to generate potential gross rents of \$300,000. Effective rental income (effective gross income) for this property is
- A. \$135,000.
  - B. \$165,000.
  - C. \$270,000.**
  - D. \$300,000.
- \_\_\_\_\_ 12. Net operating income for the second complex is
- A. \$121,500.
  - B. \$148,500.**
  - C. \$165,000.
  - D. \$300,000.
  - E. gross income generated by the investment.
  - F. before-tax cash flow available to equity investors.
  - G. after-tax cash flow available to equity investors.
  - H. CASH AVAILABLE TO DISTRIBUTE TO ALL OF THE INVESTORS.**

Use the following pro forma to answer the next three questions.

Potential gross income	\$2,400,000
– Vacancy & collections	<u>120,000</u>
Effective gross income	2,280,000
– Operating expenses	<u>798,000</u>
Net operating income	1,482,000

This property has a market value of \$12.35 million.

- \_\_\_\_\_ 13. What vacancy allowance is used in this statement?
- A. 95.00%
  - B. 10.00%
  - C. 7.50%
  - D. 5.00%**
- \_\_\_\_\_ 14. What is this property's cap rate?
- A. 8.33%
  - B. 10.00%
  - C. 12.00%**
  - D. 36.11%
- \_\_\_\_\_ 15. What is the gross income multiplier for this property?
- A. 8.33
  - B. 5.42**
  - C. 18.46
  - D. 12.00

- \_\_\_\_\_ 16. You are considering purchasing one of several office buildings. In analyzing these properties, you have determined that the current market vacancy rate for similar office buildings is 12 percent, and that operating expenses will run at about 35 percent of effective gross income. The first property you are considering has 150,000 square feet which rents at \$8.00 per square foot. Potential gross income for this building is
- A. \$150,000.
  - B. \$1.2 MILLION.**
  - C. \$14.4 million.
  - D. \$1.056 million.
- \_\_\_\_\_ 17. The expected vacancy and collection allowance is
- A. \$144,000.**
  - B. \$18,000.
  - C. \$1.728 million.
  - D. \$126,720
- \_\_\_\_\_ 18. An alternative office building is expected to generate potential gross income of \$900,000. Effective gross income for this property is
- A. \$108,000.
  - B. \$792,000.**
  - C. \$277,200.
  - D. \$514,800.
- \_\_\_\_\_ 19. Net operating income for the second building is
- A. \$108,000.
  - B. \$792,000.
  - C. \$277,200.
  - D. \$514,800.**
- \_\_\_\_\_ 20. An investor is analyzing a shopping center that is expected to generate NOI of \$100,000 in each of the next six years. Comparable sales suggest that the terminal cap rate after five years (the holding period) will be 12%. If the appropriate discount rate is 15%, what is the value of this property?
- A. \$749,529**
  - B. \$833,333
  - C. \$1 million
  - D. \$335,216
- \_\_\_\_\_ 21. Suppose in the question above that the property's value will increase by 3% per year based on its current market value. What is the current market value under this assumption?
- A. \$335,216
  - B. \$388,607
  - C. \$791,282**
  - D. None of the above (show your answer & work)

Consider a property with the following pro forma operating statement:

	PGI	\$3,750,000
-	<u>V&amp;C</u>	<u>300,000</u>
	EGI	3,450,000
-	<u>OE</u>	<u>1,207,500</u>
	NOI	\$2,242,500

This property can be purchased for \$16 million. Financing is available for this 80 percent of the purchase price over 15 years at 9.5 percent with annual debt service payments of \$1,603,929.

- \_\_\_\_\_ 22. The cap rate for this property is  
A. 7.135.  
B. 0.234.  
**C. 0.140.**  
D. 4.267.
- \_\_\_\_\_ 23. The gross income multiplier for this property is  
A. 0.216.  
B. 0.140.  
C. 7.135.  
**D. 4.638.**
- \_\_\_\_\_ 24. The operating expense ratio for this property is  
A. 2.857.  
B. 0.322.  
C. 0.539.  
**D. 0.350.**
- \_\_\_\_\_ 25. The debt-coverage ratio for this property is  
A. 0.715.  
**B. 1.398.**  
C. 0.428.  
D. 2.151.
- \_\_\_\_\_ 26. The breakeven ratio for this property is  
A. 0.350.  
B. 1.254.  
**C. 0.815.**  
D. 0.750.
- \_\_\_\_\_ 27. The net income multiplier for this property is  
**A. 7.135.**  
B. 0.216.  
C. 4.638.  
D. 4.267.

- \_\_\_\_\_ 28. The equity dividend rate (cash-on-cash return) for this property is
- A. 0.140.
  - B. 0.200.**
  - C. 5.011.
  - D. 7.135.
- \_\_\_\_\_ 29. A warehouse property has a net operating income of \$100,000 per year. ACME Finance is offering financing at 6.75% over 15 years with monthly payments and a minimum debt-coverage ratio of 1.25. What is the largest loan that ACME will provide on this property based on this debt-coverage ratio?
- A. \$125,000
  - B. \$753,373**
  - C. \$740,279
  - D. \$9.04 million
- \_\_\_\_\_ 30. Orin recently took out a new \$2.5 million mortgage at 7.00% interest amortized over 25 years with monthly payments. The first payment on this mortgage was on August 1<sup>st</sup> of this year. How much total interest will Orin pay during this calendar year.
- A. \$173,788
  - B. \$72,736**
  - C. \$72,917
  - D. \$175,000
- \_\_\_\_\_ 31. How much total interest will Orin pay on this mortgage NEXT year?
- A. \$171,024
  - B. \$212,034
  - C. \$175,000
  - D. \$172,660**
- \_\_\_\_\_ 32. Suppose you have an opportunity to purchase an office building at an 11 percent cap rate, and other office buildings in the market have been selling at a 9 percent cap rate. Which of the following statements is most true.
- A. This is may be a poor investment because the cap rate is too high.
  - B. *THIS IS MAY BE A GOOD INVESTMENT BECAUSE THE PRICE IS LOW.***
  - C. This is may be a poor investment because the price is too high.
  - D. Cap rates give us no information on which to evaluate the quality of the investment opportunity.
- \_\_\_\_\_ 33. True or **FALSE**: Net operating income captures all of the information investors need to analyze potential investment projects.

\_\_\_\_\_ 34. **TRUE** or False: Net operating income measures the total income available to be distributed to investors, regardless of how the property is financed or the tax situation of the investors.