

# **PROBLEM SOLVING IN RESIDENTIAL REAL ESTATE APPRAISING**

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**Welcome to our course on “Problem Solving in Residential Real Estate Appraising.”**

**If you have enrolled to take this course for real estate or real estate appraisal continuing education credit or for other course credit, please read over the instructions on the next page carefully. They explain in detail the requirements that have to be completed so that you can earn such credit. You will be issued a course completion certificate if you meet these requirements.**

**If you have come to our website just to browse through the text, please feel free to do so at your leisure. There are no security devices that prevent you from seeing the course material and we hope it helps you in your self-study.**

**Please share with us any comments or concerns you may have concerning this material. We are interested in your feedback. Our contact information is at the bottom of this page.**

**Many thanks for your interest in our educational programs. And, best of luck from all of us at Lee & Grant.**

**Sincerely,**

**Patricia L. Mosure  
President**

**Stephen G. Patten  
Director of Education**

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## **REQUIREMENTS FOR COURSE CREDIT**

- 1. Thank you for enrolling in Lee & Grant education on-line. This course is structured in four separate phases: textbook study, appraisals, quizzes, and end-of-course exam. All four portions must be completed in order to earn credit for the course.**
- 2. The course contains three different appraisals. Read the text material first. It reviews the principles and techniques you will be using to do the appraisals. Then, complete each appraisal in the order that it appears in the textbook, working all the assignments described in the appraisal information. Once you have finished, complete the quiz that immediately follows. E-mail us your quiz answer sheet. We will grade it and e-mail back your score along with the answers to the appraisal assignments. Send in with your first quiz answer sheet  
your suggestion form for a proctor to administer your end-of-course exam.  
You'll  
find the form two pages after this one.**
- 3. Follow this procedure for the remainder of the course: completing the assignments for each appraisal, taking the open-book quiz, and then e-mailing the answer sheet to us for grading.**
- 4. When we receive the third and final quiz answer sheet from you, we will mail your proctor the end-of-course exam, if you are not taking it at a Lee & Grant location. Contact your proctor to arrange for you to take the exam. This exam contains 50 questions and is multiple choice. It is open book and you may refer to  
course materials to complete it within the two-hour time limit. Your proctor  
will  
mail back your exam to us for grading. We will e-mail your score to you and, if you have passed, mail you a course completion certificate. You must score at least 70% on the end-of-course exam to earn credit for the course. You may retake any exam you did not pass. We will send another exam to your proctor if you request that we do so.**
- 5. Course fees are non-refundable. You have three months from your enrollment date to complete the course and pass the end-of-course exam. Any student wishing to re-enroll after the three months may do so for the full course fee effective at that time, except that a student who exceeds the three-month time**

limit while retaking an exam will not incur any additional charge.

6. Please contact us by mail, telephone, fax, e-mail any time we may be of help. Again, thank you for coming to Lee & Grant Company. And now, in order to let your instructor introduce himself, please turn the page.

## **FROM THE INSTRUCTOR**

On behalf of Pattie Mosure, who is the president of Lee & Grant Company, I'd like to welcome you to our course on "Problem Solving in Residential Real Estate Appraising."

My name is Steve Patten. I'll be your instructor for this course, which we hope you will find most beneficial to you and helpful in meeting those goals you have set for yourself. You have all the details on the previous page of how to complete the course. We at Lee & Grant are very interested in your success in understanding the material and passing the course.

In addition to ensuring the course material is properly presented to you, my role as an instructor also includes answering any questions you may have along the way. So, I am as close as your e-mail. Anytime you have a question or maybe just want to make an observation or suggestion, ring me up at:

**leeandgrant@leeandgrant.com**

In the title section of your email put "Question for Steve" or something like that and also please mention the course, if not in the title, at least somewhere near the start of your message. I will get back to you as quickly as possible. It is good to have you here.

Well, that is all I have to say, other than Good luck and enjoy!

(Your proctor form is on the next page and the table of course contents is on the following page.)

## **PROCTOR SUGGESTION**

**Your end-of-course exam may be taken at Lee & Grant Company's corporate headquarters in Atlanta, Georgia. Please contact us to arrange for when you would like to come in. If this would not be convenient for you, we can arrange for you to take the exam at the conclusion of one of our classes around the country, if a classroom and instructor are available. We can send you a list of our course locations if you would prefer this way of taking your exam. We may also approve an outside proctor whom you can suggest. This proctor, for example, could be a responsible official from another school or the education officer of a professional appraiser or real estate organization, such as a real estate board. Complete the following and send this form in with your first quiz answer sheet.**

**Student name:** \_\_\_\_\_

**Mailing address:** \_\_\_\_\_  
\_\_\_\_\_

**Course name:** \_\_\_\_\_

**Check one of the following:**

**I would like to take the exam at Lee & Grant's offices in Atlanta. I will contact Lee & Grant to make arrangements.**

**I would like to take the exam at the conclusion of a Lee & Grant course given outside of Atlanta. Please send me course locations.**

**I want to suggest the following proctor to administer the exam. I understand Lee & Grant Company has the right to approve or disapprove any proctor**

suggestion I offer and I agree to abide by any such Lee & Grant decision.

Proctor name: \_\_\_\_\_

Title and  
organization: \_\_\_\_\_

\_\_\_\_\_

Mailing address: \_\_\_\_\_

\_\_\_\_\_

Telephone number: \_\_\_\_\_

## **TABLE OF CONTENTS**

<b>I.</b>	<b>Sequence of adjustment in the sales comparison approach</b>	<b>page 1</b>
<b>II.</b>	<b>Units of comparison</b>	<b>7</b>
<b>III.</b>	<b>Paired data set analysis</b>	<b>7</b>
<b>IV.</b>	<b>Fannie Mae guidelines for adjustments</b>	<b>10</b>
<b>V.</b>	<b>Land valuation methods</b>	<b>12</b>
<b>VI.</b>	<b>Methods for estimating accrued depreciation</b>	<b>16</b>
<b>VII.</b>	<b>Reconstructed operating statement</b>	<b>21</b>
<b>VIII.</b>	<b>Capitalization rates</b>	<b>24</b>
<b>IX.</b>	<b>Valuation in income capitalization</b>	<b>25</b>

**X. Expense ratios** 27

**XI. Taking a weighted average** 28

**Appraisal #1** A1-1

**Quiz #1** Q1-1

**Appraisal #2** A2-1

**Quiz #2** Q2-1

**Appraisal #3** A3-1

**Quiz #3** Q3-1

**I. There is a suggested sequence of adjusting the comparables in the sales comparison approach that calls for the adjustment first of the transactional characteristics of the comparable sale before adjustments are made for property characteristics, the physical and locational differences among the comparables and the subject property.**

**A. The order of adjustment for the transactional characteristics**

**1. Property rights conveyed**

**a. This is an adjustment for the difference, if any, in the interest sold of the comparable from that interest expected to be conveyed in the subject property.**

**b. Examples of interests that may be conveyed**

**(1) Fee simple**

**(2) Leased fee**

**(3) Leasehold**

**2. Financing**

does

a. **An adjustment for financing may be required when the financing of the comparable affected its sales price in a way that the appraiser not expect for the subject or, conversely, when special financing will affect the subject in a manner that did not similarly affect the comparable.**

b. **Calculating the adjustment**

draw

(1) **The preferred method is to use market evidence by pairing sales of similar properties affected and unaffected by financing to a conclusion on what impact financing had on a sale.**

(2) **If paired sales are unavailable, the appraiser may consider using a discounting technique in which the face amount of the loan is compared to its market value.**

value

(a) **A loan made at a below-market rate, for example, would not be worth its face amount, because the secondary mortgage market would pay less for the loan, meaning its market**

**-1-**

**is less than the face amount of the loan, since the loan is not generating a market return at its below-market interest rate.**

(b) **The loss associated with the loan, if it were sold in the secondary mortgage market, would represent the potential financing, adjustment under the logic that any lender making this loan (maybe an owner just to get the property sold) would try to inflate the sales price of the property to recover the loss in making the loan.**

(3) **Calculation procedure**

the

(a) **Calculate the loan payment of the below-market interest rate loan.**

(b) **Discount the loan payment at the market rate over the life of loan in order to calculate the market value of the loan.**

the  
financing.

(c) **The difference between the face amount of the loan and the market value of the loan (the market value will be less than face amount) represents the loss to the lender, the seller of the property, for example, when the seller is carrying the**

then  
by

(d) **If the appraiser is convinced the lender/seller padded the purchase price to make up the loss associated with the loan, the appraiser should make a downward financing adjustment that magnitude the appraiser believes the price has been increased to compensate for the loan loss.**

to  
sales

i. **Care should be exercised in making the adjustment equal the loss, for the lender/seller may have been able in the negotiation only to have pushed up the sales price by an amount less than the actual loss, which is recognized in the Fannie Mae guideline that warns the appraiser not to necessarily make this financing adjustment a “dollar-for-dollar” adjustment.**

down  
increases  
costs.

ii. **This is similar to the situation where a developer buys interest rates for sales in the subdivision and then the sales prices of the homes to make up the financing**

-2-

#### (4) Example

the

**Financing for a comparable was carried by the seller at 10% for 20 years with monthly amortization. The loan amount was \$125,000. and the sales price was \$175,000. The market interest rate for this type of loan was 12%. If the appraiser believes the seller inflated**

**purchase price by the loss associated with this loan, what is the proper financing adjustment under the assumption the loan will be held to maturity?**

**Note to student: We will show discounting problems in this course both through the use of the Ellwood compound interest and discount tables and with the HP-12 financial calculator.**

**Solution:**

**Monthly loan payment:**

**\$125,000.**  
**x.009650**    **Column 6, 10% monthly tables,**  
**20-year row**  
**\$1,206.25**

**HP-12C keystrokes for monthly payment:**

**125000**  
**PV**  
**10**  
**g**  
**i**  
**20**  
**g**  
**n**  
**PMT**    **Ans: \$1,206.28 (The HP-12C, which carries out calculations to nine places to the right of the**

**decimal,**

**the**

**is slightly more accurate than**

**Ellwood tables, which carry out calculations six places to the right of the decimal.)**

**Present value of the loan:**

\$1,206.25	
<u>x90.819416</u>	Column 5, 12% monthly tables, 20-year row
\$109,550.92	

HP-12C keystrokes for present value:

1206.28  
PMT  
12  
g  
i  
20  
g  
n  
PV    Ans: \$109,553.65

The financing adjustment is the amount by which the appraiser believes the sales price was inflated to make up for the loan loss, which is calculated by taking the difference between what the face amount of the loan is and the present value of the loan:

\$125,000.	face amount of the loan
<u>-109,551.</u>	present value of the loan
\$ 15,449.	

(5) A financing adjustment may also be calculated by assuming that instead of the loan running to maturity, the loan will be paid off prior to the completion of its full term.

(a) The present value of the loan, then, is the sum of the present value of the loan payments over the projected life of the loan before it is terminated and the present value of the balance

of

the loan at the time of its termination.

(b) The financing adjustment is then calculated, as it was under the previous assumption that the loan would run to maturity, as the difference of the face amount of the loan and its

present

value.

**3. Conditions of sale**

- a. An adjustment for unusual motivations of the buyer and/or seller that affected the sales price of the comparable in a manner that would not have been expected if the sale had been an arm's length of the market**
- b. Examples include threat of foreclosure, assemblage, sale among family or friends.**

**4. Market conditions**

- a. Adjustment to reflect changes, if any, in the market that have caused properties to appreciate or depreciate**
- b. This is often mistakenly called the "time adjustment," but there is no adjustment required by the simple lapse of time since the comparable sold, unless there has been appreciation or depreciation in the market dating from that sale of the comparable.**

**B. Each of the four possible adjustments for differences in the sales transactions**

- of the comparables from that expected for the subject precedes any adjustments for property characteristics.**
- 1. After the adjustment for property rights conveyed, each subsequent transactional adjustment is made to the previously adjusted sales price of the comparable and not to the comparable's original, unadjusted sales price.**
  - 2. Once all transactional adjustments have been made, each of the ensuing property adjustments is calculated on the sales price of the comparable after having been adjusted for the last of the transactional adjustments, the market conditions adjustment.**
    - a. The adjusted sales price through the market conditions adjustment is the "base" for the calculation of any percentage property adjustments.**

- b. An adjustment expressed as a dollar amount would simply be added or subtracted, but adjustments expressed as percentages would be calculated for all property characteristics by taking the percentage of the comparable sales price in each case adjusted through market conditions.

-5-

**C. Property adjustments**

**1. Adjustments for physical and locational characteristics**

2. They may be taken in any sequence, as long as any percentage adjustments are calculated on the sales price of the comparable adjusted through market conditions.

**D. Example**

What is the adjusted sales price of a comparable that sold for \$160,000. if the adjustment for property rights conveyed is -\$8,000., for market conditions +3%, for square footage -2%, for location +7%, -\$4,000. for financing, and +5% for conditions of sale?

**Solution:**

\$160,000.	
<u>- 8,000.</u>	
\$152,000.	adjusted through property rights
<u>- 4,000.</u>	
\$148,000.	adjusted through financing
<u>x .05</u>	
7,400.	
\$148,000.	
<u>+ 7,400.</u>	
\$155,400.	adjusted through conditions of sale
<u>x .03</u>	
4,662.	
\$155,400.	



1. Sales price per square foot
2. Sales price per apartment unit
3. Sales price per acre

### III. Paired data set analysis

#### A. Method of estimating the adjustment for a transactional or property characteristic, called an “element of comparison,” by matching the sales prices of properties with and without the characteristic or element

1. The goal is to try to estimate what the market paid for the element by comparing when the element is present in a sale and when it is not present.

-7-

2. Successive comparisons in the marketplace can show what value is placed on the element by what is apparently being paid for that element.

#### B. Procedure

1. Isolate a pair of comparables that primarily differ only in the element of comparison being studied.
2. The difference in sales price between the comparables is attributed to what the market paid for the element.
3. If the comparables differ in more than one element of comparison, one or both of the comparables must be adjusted until they differ only in the one element of comparison for which the appraiser is trying to estimate the proper adjustment as indicated by market actions.
  - a. The adjustment process of trying to “equalize” the comparables, except for the element of comparison being isolated, should arrive at a sales price that the comparable would have sold for had it been just like the other comparable in all respects but the element of comparison the appraiser is studying.

b. Conclusions concerning what market actions indicate an element is worth are only approximations and are as good as the quality of the appraiser's research and the consistency of the comparables used.

C. Example

<u>Element</u>	<u>Comp 1</u>	<u>Comp 2</u>	<u>Comp 3</u>	<u>Comp 4</u>	<u>Comp 5</u>
Sales price	\$160,000.	\$161,500.	\$161,800.	\$159,000.	\$162,500.
Basement	Finished	Finished	Unfinished	Unfinished	Finished
Location	Eastside	Westside	Westside	Westside	Westside
Condition	Good	Average	Good	Average	Average
Kitchen	Old	Old	Modern	Old	Modern

Compare Comparables 2 and 4. The only difference is the unfinished basement versus the finished basement. Since the comparable with the finished basement, Comparable 2, sold for \$2,500. more than Comparable 4,

-8-

which has an unfinished basement, the market appears to value the element of a finished basement over unfinished by \$2,500. This is an indication, then, of what the adjustment should be for a finished over an unfinished basement.

Now go to Comparables 2 and 5, where the only difference is in the kitchen. The adjustment for a modern over an old kitchen is \$1,000., the difference in sales price between the superior comparable with the modern kitchen, Comparable 5, and Comparable 2 with the old kitchen.

Next, let's take a look at Comparables 1 and 3. There are three different elements of comparison, but the adjustments for two of them, basement and kitchen, have already been estimated from other market evidence. Adjust these two comparables to remove the differences in elements for which the adjustments are known. That is, adjust the sales prices of the comparables to what they would have been, based on your market analysis thus far with

the other comparables, if they were made alike in every respect except for the element you are trying to isolate.

For example, deduct \$2,500. from Comparable 1's selling price to see what it

would have sold for had it not had the finished basement. The resulting \$157,500., then, is what it would have sold for with only an unfinished basement. Next, add \$1,000. to Comparable 1's adjusted sales price to

make

it like Comparable 3 with the modern kitchen. The \$158,500. adjusted sales

price that results from these two adjustments to Comparable 1 show what Comparable 1 would have sold for if it had been similar in every respect considered, except for location. Hence, the conclusion is that Comparable

3

selling for \$3,300. more than what Comparable 1 would have sold for as adjusted is attributable to the one remaining difference between them, location, where the market appears to prefer westside over eastside. Adjustment for location: \$3,300. in favor of westside.

Look at Comparables 1 and 5. Add \$1,000. to Comparable 1 to see what it would have sold for with a modern kitchen, giving an adjusted sales price

for

Comparable 1 of \$161,000. Deduct \$3,300. from Comparable 5 to see what it

would have sold for if it were in the inferior eastside location, giving an adjusted sales price for Comparable 5 of \$159,200. We are doing this, of course, to make the comparables alike except for the element we are trying

to

value. The \$1,800. remaining difference in adjusted sales prices between the

two comparables is attributed to the one element of comparison that is still not the same for the two comparables: condition. So, we conclude that the adjustment for condition is \$1,800. in favor of good condition over average.

The above discussion represents one approach to solving for the adjustments

for each of the elements of comparison. Other combinations of these

-9-

comparables could have been used. And they could have been adjusted differently. You might change only the first comparable when comparing two comparables. Or change only the second. Or change each one. The

point to reach, however, is to have the comparables alike in every element of

comparison, except for the element you are trying to value. The indicated adjustment for that element, then, will be the dollar amount by which the sales price or adjusted sales price of one differs from the other. You are attributing the remaining difference in prices to the remaining single difference in their elements of comparison.

#### IV. Fannie Mae guidelines for adjustments

##### A. Line adjustment

###### 1. Any single adjustment

###### 2. Percent line adjustment

a. Line adjustment divided by the original, that is, unadjusted sales price of the comparable

b. From the example of adjusting a comparable on pages 6 and 7, the percent line adjustment for property rights conveyed would be:

$$- \$8,000 \div \$160,000. = -.05 = -5\%$$

c. There is no Fannie Mae guideline for maximum percent line adjustment, although the FHA appraisal guideline from the U.S. Department of Housing and Urban Development (HUD) of 10% for its maximum percent line adjustment (see HUD manual 4150.2) is often mistakenly referred to as a Fannie Mae guideline.

##### B. Net adjustment

1. The resulting adjustment when all downward adjustments are subtracted and all the upward adjustments are added

2. It is the difference between the original, unadjusted sales price of the comparable and the final sales price to which that comparable is adjusted.

###### 3. Percent net adjustment

a. The net adjustment divided by the original, unadjusted sales price of

the comparable

-10-

- b. From the example of adjusting a comparable on pages 6 and 7, the percent net adjustment would be:

- \$8,000.	property rights conveyed
- 4,000.	financing
+ 7,400.	conditions of sale
+ 4,662.	market conditions
- 3,201.	square footage
<u>+11,204.</u>	location
\$ 8,065.	net adjustment

$$\text{Percent net adjustment} = \$8,065 \div \$160,000.$$

$$= +.0504 = +5\%$$

- c. The Fannie Mae guideline is a maximum of 15% and, if an adjusted comparable exceeds this guideline and the appraiser wants to use it, that appraiser should explain and justify its use in the appraisal report.

### C. Gross adjustment

1. The sum of all the adjustments for a comparable, disregarding whether the adjustments are upward or downward, that is, plus or minus

2. Percent gross adjustment

- a. The gross adjustment divided by the original, unadjusted sales price of the comparable

- b. From the example of adjusting the comparable on pages 6 and 7, the percent gross adjustment would be:

\$8,000.	property rights conveyed
4,000.	financing
7,400.	conditions of sale
4,662.	market conditions
3,201.	square footage
<u>+11,204.</u>	location
\$38,467.	gross adjustment

$$\begin{aligned}\text{Percent gross adjustment} &= \$38,467 \div \$160,000. \\ &= .2404 = 24\%\end{aligned}$$

-11-

- c. **The Fannie Mae guideline is a maximum of 25% and, if an adjusted comparable exceeds this and the appraiser wants to use it, the appraiser should explain and justify its use in the appraisal.**

## **V. Land valuation methods**

### **A. Sales comparison**

1. **Recent sales of similar plots of land are compared to the subject land, adjusted for differences, and the adjusted sales prices are reconciled to an opinion of value for the subject.**
2. **This is often the most reliable and convincing method for valuing land, but is dependent upon an available supply of comparable sales in order to value the subject.**

### **B. Allocation**

1. **A method of land valuation in which the land is estimated as a percentage of the overall property value**
2. **Procedure for valuation**
  - a. **Estimate land-to-property ratios for properties considered comparable to the subject.**
  - b. **Apply a reconciled land-to-property ratio of the comparables to the subject property for a valuation of the land component of the subject.**
3. **Example**

**If the land-to-property ratio for single-family homes in the subject's market is approximately 30% and if the subject land improved with a single-family home sold for \$180,000., what is a valuation of the land**

component of the subject?

**Solution:**

\$180,000.	subject property value
<u>x .30</u>	land-to-property ratio
\$ 54,000.	land value

-12-

### C. Extraction

1. Land valuation method in which the depreciated value of the improvements is deducted from the property value to yield an indicated value for the land
2. Procedure for valuation
  - a. Estimate the cost of the improvements.
  - b. Estimate the total accrued depreciation for the improvements.
  - c. Deduct the accrued depreciation of the improvements from the improvements cost new to arrive at a depreciated value of the improvements.
  - d. Deduct the depreciated value of the improvements - its as-is value - from the value of the property for a value of the land component only.
3. Example

Accrued depreciation for a 10-year-old duplex is put at \$14,000. Cost new for the duplex has been calculated for both reproduction and replacement

cost, of which the \$205,000. figure for replacement cost appears more reliable. The property recently sold for \$249,000. in a transaction representative of the market. Using these figures, what is the indicated value of the land component of the duplex?

**Solution:**

\$205,000.	improvements replacement cost
------------	-------------------------------

<u>- 14,000.</u>	accrued depreciation
\$191,000.	depreciated value of the improvements
\$249,000.	property value
<u>-191,000.</u>	improvements value
\$ 58,000.	land value

**D. Subdivision development analysis**

with  
 1. Land valuation method that can be used when subdividing is the highest and best use of the land in which the total costs and profit associated subdividing (aside from land acquisition) and then selling the improved

-13-

or unimproved land are subtracted from the total sales revenues for the properties to yield what the market would pay for the land

2. Valuation procedure

it,  
 a. Calculate all costs and profit required to subdivide the land and sell except for the costs expended to buy the land for this development.

build  
 (1) Direct (hard) costs are those costs that must be expended to the improvements, such as labor, materials, permit fees, cost of construction financing.

the  
 (2) Indirect (soft) costs are those costs required to market and sell properties to the buying public, such as marketing and advertising, brokerage commissions, appraisal fees, costs of long-term financing.

(3) Entrepreneurial profit is the financial incentive, reward that the developer can earn from the project.

of  
 b. Project the total sales revenues expected to be earned from the sale of the land and deduct from this figure the total costs and profit figured above.

(1) The resulting figure should represent the one cost and profit not yet taken into account, namely the cost and any profit associated with acquiring the land originally for this development.

(2) The technique here rests on the assumption that the market will pay more for the subdivided land than what was calculated in above and this increment is what the market figures the land is worth.

(3) This would represent land value only if the time to sell the land

is

relatively brief and, if it is not and it required substantial time to sell the land, then the dollars the market paid for the land must

be

discounted in order to say they are equal to a present value for

the

land.

c. If substantial time were required to sell the land, discount the land dollars at an appropriate rate to come up with a present value for the land.

-14-

### 3. Example

A developer projects that total direct costs for a 50-home subdivision

are

\$110,000. per home and that total indirect costs are \$15,000. per home.

Entrepreneurial profit is pegged at 20% of the sum of the direct and

indirect costs. If the projected sales revenues for the subdivision are

estimated to be \$10,000,000., what is the indicated value of the land if

an

even absorption rate is expected over the two years it is believed it will require to sell these homes?

**Solution:**

\$110,000.	direct costs per home
<u>x 50 homes</u>	
\$5,500,000.	total direct costs

\$15,000.	indirect costs per home
<u>x 50 homes</u>	
\$750,000.	total indirect costs
\$5,500,000.	
<u>+ 750,000.</u>	
\$6,250,000.	total direct and indirect costs
<u>x .20</u>	
\$1,250,000.	entrepreneurial profit
\$6,250,000.	
<u>+1,250,000.</u>	
\$7,500,000.	total costs and entrepreneurial profit
\$10,000,000.	total sales revenues
<u>-7,500,000.</u>	total costs and profit
\$2,500,000.	dollars market is paying for land

If the marketing time to sell these properties were projected to be brief, the \$2,500,000. the market is paying for the land would represent the value of the land. But the problem said that it would take two years to sell out the subdivision, so the land dollars earned over these two years must be discounted to a present value. The problem said an even absorption was projected, so the dollars

realized

for each of the two years would be:

$$\$2,500,000. \div 2 \text{ years} = \$1,250,000. \text{ per year}$$

-15-

You can use the Ellwood compound and interest discount tables to discount this cash flow. If the appraiser selects a 15% annual

discount

rate as appropriate to discount the land dollars, the calculation is:

\$1,250,000.	
<u>x1.625709</u>	Column 5, 15% annual tables, two-year row
\$2,032,136.	land value

Or, you can use a financial calculator. The following keystrokes are for the HP-12C:

1250000

PMT

2

n

15

i

PV

Ans: \$2,032,016.

#### E. Land residual

1. Capitalization technique that values land by capitalizing the earned income attributed to the land component of the property
2. The value of the building, the property net operating income, and the capitalization rates suitable for the land and building components must be known or able to be estimated to employ this method.

#### F. Ground rent capitalization

1. Land valuation method that capitalizes the income earned from long term leases on land
2. The capitalization rate used for this technique should reflect the risk factors associated with these leases that can run for 99 years and are often considered to be less risky than shorter term leases.

### VI. Methods for estimating accrued depreciation

#### A. Economic age-life

1. Estimate of depreciation loss that assumes an even loss per year over the entire economic life

-16-

2. Procedure

- a. Estimate cost new of the improvements.
- b. Divide the improvements cost new by the total economic life in order to calculate the average depreciation loss per year of economic life.

(1) Assume that there is no salvage value for the improvements at the

end of their economic life.

(2) This method also requires the assumption that the depreciation loss is even over each year of the economic life.

c. Estimate the current effective age of the improvements and multiply the effective age by the average depreciation loss per year in order to calculate the accrued depreciation.

### 3. Example

A building whose effective age is estimated at eight years has a projected total economic life of 60 years. If the replacement cost of the building is \$450,000., what is the indicated accrued depreciation?

Solution:

$$\begin{array}{r} \$450,000. \div 60 \text{ years} = \$7,500. \text{ per year} \\ \text{depreciation loss} \end{array}$$

$$\begin{array}{r} \$7,500. \\ \times 8 \text{ years} \quad \text{effective age} \\ \hline \$60,000. \quad \text{accrued depreciation} \end{array}$$

### B. Modified economic age-life

1. Calculates accrued depreciation by separately estimating curable and incurable depreciation and adding them to get an estimate of total depreciation

#### 2. Procedure

a. Estimate cost new of the improvements.

b. Estimate curable depreciation, such as by calculating cost to cure.

-17-

c. Deduct the curable depreciation estimate from the cost new of the improvements in order to calculate the total incurable depreciation possible - the potential incurable depreciation - for the improvements over their economic life.

- d. Divide the total potential incurable depreciation by the total economic life in order to estimate the average loss per year in incurable depreciation, which is representative of the gradual wasting away of the asset.
- e. Calculate the accrued incurable depreciation by multiplying the average loss per year in incurable depreciation by the effective age of the improvements.
- f. The total accrued depreciation is the sum of the curable depreciation (step b) and the incurable depreciation (step e).

**3. Example**

In the previous example on page 17 for estimating accrued depreciation by the economic age-life method, calculate the accrued depreciation using the modified economic age-life method if curable depreciation is put at \$50,000.

**Solution:**

<b>\$450,000.</b>	<b>improvements cost new</b>
<b><u>- 50,000.</u></b>	<b>curable depreciation</b>
<b>\$400,000.</b>	<b>potential incurable depreciation</b>

**\$400,000. ÷ 60 years = \$6,667. average per year loss in incurable depreciation**

<b>\$6,667.</b>	
<b><u>x 8 years</u></b>	<b>effective age</b>
<b>\$53,333.</b>	<b>actual accrued incurable depreciation</b>

<b>\$50,000.</b>	<b>curable depreciation</b>
<b><u>+53,333.</u></b>	<b>incurable depreciation</b>
<b>\$103,333.</b>	<b>total accrued depreciation</b>

Note that by correcting the curable depreciation the remaining economic life might be extended and the effective age reduced. Both would have the effect of lowering the estimate for accrued depreciation.

**C. Observed condition/breakdown**

1. Accrued depreciation is calculated by adding up estimates for each of the five major categories of depreciation.

2. Procedure

a. Estimate curable physical deterioration.

(1) Measured by cost to cure

(2) Example

A single-family home needs exterior painting (cost: \$1,100.), roof repairs (cost: \$650.), replacement of siding panels (cost: \$425.), and new porch stairs (cost: \$500.). Doing all of this will increase the value of the home by \$5,000. What is an estimate

of

the curable physical deterioration present?

**Solution:**

\$1,100.	painting
650.	roof repairs
425.	siding panels
<u>+ 500.</u>	porch stairs
\$2,675.	

Since the value of the home is raised by \$5,000. with \$2,675.

of

repairs, this deterioration is classified as curable, which is defined as where the value of the improvements will be increased by at least the amount equal to the cost to correct.

b. Estimate incurable physical deterioration.

(1) Procedure

**incurable**

- (a) Deduct the curable physical deterioration from the cost new of improvements in order to calculate the potential physical deterioration.

**-19-**

- (b) Calculate the average incurable physical deterioration per year over the economic life of the improvements by dividing the potential incurable physical deterioration by the total economic life.

**deterioration**

- (c) Multiply the average annual incurable physical loss by the effective age to estimate the accrued incurable physical deterioration.

**(2) Example**

**deterioration**

In the preceding example on page 19 for curable physical deterioration, what is the accrued incurable physical

if improvements cost new is \$100,000., the total economic life is 65 years, and the effective age is 10 years?

**Solution:**

\$100,000.	improvements cost new
<u>- 2,675.</u>	curable physical
\$ 97,325.	potential incurable

\$97,325. ÷ 65 years =

\$1,497. average incurable physical  
deterioration over total economic  
life

\$1,497.	
<u>x 10 years</u>	effective age
\$14,973.	accrued incurable physical deterioration

The total physical deterioration would be the sum of the curable physical and incurable physical deterioration, \$2,675. added to \$14,973., for a loss of \$17,648.

- c. Curable functional obsolescence could be estimated by cost to cure.
- d. Incurable functional obsolescence may be estimated by paired sales analysis or, for income-producing properties, capitalization of rent loss.

-20-

- e. Estimate external obsolescence, which is generally considered to be incurable.

- (1) Dollar loss could be estimated by paired sales or capitalization of rent loss for income-producing properties.
- (2) Any penalty resulting from external obsolescence should be applied only to the improvements by pro-rating the dollar loss in value using the building-to-property ratio.

(3) Example

physical  
  
  
  
for

Two single-family homes that sold recently are similar in characteristics, but one with a selling price of \$91,500. is in an area that is slowly changing to retail usage. The other is in a residential section unaffected by retail encroachment and sold

\$97,500. Building-to-property ratios for homes in this market are approximately 80%. Estimate the depreciation for external obsolescence that should be charged similar single-family homes in the area penalized by the retail encroachment.

Solution:

\$97,500.	
<u>- 91,500.</u>	
\$ 6,000.	indicated value loss by paired sales

\$6,000.	
<u>x .80</u>	
\$4,800.	building-to-property ratio depreciation from external obsolescence applicable to

**the improvements**

**f. The total estimated accrued depreciation is the sum of each category of depreciation loss noted for the subject improvements.**

**VII. Reconstructed operating statement**

**A. Presentation of properly included incomes and operating expenses for an income-producing property utilized for the purpose of profiling and valuing the property**

**-21-**

**B. Incomes**

**1. Monthly gross rent (MGR)**

**a. The maximum income that the property can generate per month from its rental units**

**b. It may be capitalized into an indication of value by a gross rent multiplier.**

**2. Potential gross income (PGI)**

**a. Maximum annual income a property can generate if fully occupied for the year and does not suffer any collection losses, that is, 100% of the scheduled income the property is capable of earning**

**b. May be capitalized - converted into a value opinion - by a potential gross income multiplier**

**3. Other income (OI)**

**a. Income from a property earned from sources other than the rental units, such as from laundry, parking, storage**

**b. Adjustment for vacancy and collection loss**

- it
- (1) If the other income figure has not yet been adjusted for this loss, should be added to the potential gross income and a vacancy factor applied to the sum of the two incomes.
  - (2) If the other income already reflects a vacancy factor - for example, the appraiser used actually earned other income from previous years, that other income figure should be added after the potential gross income has been adjusted for vacancy and collection loss.

#### 4. Effective gross income (EGI)

- a. Annual income from property after potential gross income has been adjusted for vacancy and collection loss and other income has been added - it is the income that is expected to be actually earned by the property over the year
- b. It may be capitalized by an effective gross income multiplier to yield an opinion of value for the subject property generating the income.

-22-

#### 5. Net operating income (NOI)

- a. The income calculated for a property after the property's operating expenses have been deducted from the effective gross income
- b. Owner expenses, such as debt service (mortgage payments) and taxes on income generated by the property, should not be included in the property expenses that are deducted from effective gross income to arrive at net operating income.
- c. In order to derive an opinion of value, net operating income may be capitalized by a capitalization rate by division.

### C. Property operating expenses

#### 1. Fixed

- a. Those expenses that do not vary with level of occupancy in the property
- b. Typically include real property taxes and hazard insurance

**2. Variable**

**a. Those expenses that do vary with level of occupancy of the property**

**b. Examples**

**(1) Maintenance**

**(2) Management (usually)**

**(3) Utilities**

**3. Reserves for replacements**

**a. Monies set aside to pay for short-lived depreciating items of real and personal property that need to be replaced periodically**

**b. Examples of replacement items**

**(1) Roof**

**(2) Kitchen appliances**

**-23-**

**(3) Carpeting**

**D. Example**

**A four-unit building rents for \$500. per month for two of the units and \$550. per month for the other two. An applicable vacancy and collection loss factor is 8%, there is no other income, and the annual operating expenses are \$9,150. Mortgage payments for the year are \$10,375. What is a proper reconstructed operating statement for this property?**

**Solution:**

<b>\$2,100.</b>	<b>monthly gross rent</b>
<b><u>x 12 months</u></b>	
<b>\$25,200.</b>	<b>potential gross income</b>
<b><u>x .08</u></b>	<b>vacancy and collection loss factor</b>
<b>\$ 2,016.</b>	<b>vacancy and collection loss</b>

\$25,200.	
<u>- 2,016.</u>	
\$23,184.	effective gross income
<u>- 9,150.</u>	operating expenses
\$14,034.	net operating income

the  
the  
any

Note that if there had been other income, it would have been added to \$25,200. and the resulting sum adjusted for vacancy and collection loss if the other income figure did not reflect a vacancy factor already. If, on the other hand, the appraiser used an other income in which vacancies had been taken into account (such as actual other income earned in previous years), that other income would have been added to the \$23,184. and the resulting income would have been the effective gross income. However effective gross income is calculated, it should include other income if any has been earned.

### VIII. Capitalization rates

#### A. Gross rent multiplier (GRM)

price

1. Derived from sales of comparable properties, it is the ratio of sales price (SP) to monthly gross rent that is reconciled from those comparable sales.

2.  $GRM = SP \div MGR$

-24-

#### B. Potential gross income multiplier (PGIM)

1. Derived from sales of comparable properties, it is the ratio of sales price to the potential gross income that is reconciled from those comparable sales.

2.  $PGIM = SP \div PGI$

#### C. Effective gross income multiplier (EGIM)

1. Derived from sales of comparable properties, it is the ratio of sales price to the effective gross income that is reconciled from those

comparable sales.

2.  $EGIM = SP \div EGI$

**D. Capitalization rate by division (R)**

1. Derived from sales of comparable properties, it is the ratio of net operating income to the sales price that is reconciled from those comparable sales.

2.  $R = I \div V$

I = NOI = net operating income

V = value = sales price (used when the sales price represents value)

**IX. Valuation in income capitalization**

**A. Gross rent multiplier**

1. Multiply the monthly gross rent of the subject by a gross rent multiplier derived from the market.

2.  $V = MGR \text{ (subject)} \times GRM \text{ (market)}$

**B. Potential gross income multiplier**

1. Multiply the potential gross income of the subject by a potential gross income multiplier derived from the market.

2.  $V = PGI \text{ (subject)} \times PGIM \text{ (market)}$

-25-

**C. Effective gross income multiplier**

1. Multiply the effective gross income of the subject by an effective gross income multiplier derived from the market.

2.  $V = EGI \text{ (subject)} \times EGIM \text{ (market)}$

**D. Capitalization rate by division**

1. Divide the net operating income of the subject by a capitalization rate

derived from the market.

$$2. V = I \text{ (subject)} \div R \text{ (market)}$$

#### E. Example

Value the property whose reconstructed operating statement is shown in the previous example on page 24 using the following capitalization rates:

$$\begin{aligned} \text{GRM} &= 65 \\ \text{PGIM} &= 5.25 \\ \text{EGIM} &= 5.75 \\ R &= 11.50\% \end{aligned}$$

**Solution:**

$$\begin{aligned} V &= \text{MGR} \times \text{GRM} \\ &= \$2,100. \times 65 \\ &= \$136,500. \end{aligned}$$

$$\begin{aligned} V &= \text{PGI} \times \text{PGIM} \\ &= \$25,200. \times 5.25 \\ &= \$132,300. \end{aligned}$$

$$\begin{aligned} V &= \text{EGI} \times \text{EGIM} \\ &= \$23,184. \times 5.75 \\ &= \$133,308. \end{aligned}$$

-26-

$$\begin{aligned} V &= I \div R \\ &= \$14,034. \div .1150 \\ &= \$122,035. \end{aligned}$$

#### X. Expense ratios

#### **A. Operating expense ratio (OER)**

- 1. It is the ratio of operating expenses (OE) to effective gross income and represents that portion of collectible income that is spent to pay for the operating expenses.**
- 2.  $OER = OE \div EGI$**
- 3. Multiplying the effective gross income by the operating expense ratio calculates the operating expenses.**
  - a. The operating expense ratio is usually expressed as a percentage.**
  - b. A 45% OER indicates, for example, that the operating expenses would be \$45,000. if the effective gross income were \$100,000.**

#### **B. Net income ratio (NIR)**

- 1. It is the ratio of net operating income to effective gross income and represents that portion of collectible income that is retained after payment of operating expenses.**
- 2.  $NIR = NOI \div EGI$**
- 3. Multiplying the effective gross income by the net income ratio calculates the net operating income.**
  - a. The net income ratio is usually expressed as a percentage and is the complement of the operating expense ratio, that is, the percentages of the two ratios add up to 100%.**
  - b. A 55% NIR indicates, for example, that the net operating income is \$55,000. if the effective gross income is \$100,000.**

-27-

### **XI. Taking a weighted average**

- A. The process of reconciliation often involves taking a weighted average of the numbers being considered in order to arrive at the numerical conclusion**

and may be calculated by weighting each number by its applicability, expressed as a percentage.

**B. Example**

An appraiser valuing the subject has come to the following indications of value:

By sales comparison approach: \$150,000.

By cost approach: \$157,500.

By income approach: \$147,000.

If the appraiser decides to weight the sales approach at 50% and the cost and income approaches at 25% each, what would be the reconciled opinion of value?

**Solution:**

Sales: \$150,000. x .50 = \$75,000.

Cost: \$157,500. x .25 = \$39,375.

Income: \$147,000. x .25 = +\$36,750.

\$151,250. - weighted average

explain Note that the appraiser in performing this reconciliation must in the appraisal report the reasoning behind the assignment of the weightings to the various numerical indications.

**Appraisal #1: Appraiser Boyd has chosen four comparables she intends to use in the**

**of**

**sell,**

**where**

**valuation of a single-family home by the sales comparison approach. Boyd is dealing in a particularly difficult market in which transactional adjustments are routinely required in the adjustment**

**comparables to subject properties. This is due to the transitional nature of this market where an increasing number of properties are going from owner-occupancy to rentals. And, when these owners**

**they are occasionally carrying part or all of the financing.**

**Boyd's subject is one of the few potential sales in recent months**

**the owner is not renting and also is unwilling to carry any of the financing. Elements of comparison for the subject:**

- Property rights conveyed: fee simple**
- Financing: market (by institutional lender)**
- Conditions of sale: none**
- Market conditions: current**
- Location: southside**
- Square footage: 1861**
- Functional utility: average**

**The four comparables Appraiser Boyd has selected include two in which the property rights conveyed were fee simple and one in which the owner carried financing. Another was sold under unusual conditions of sale. The four comparables:**

**owner**

**at**

**Comparable #1: This was a fee simple sale financed by the**  
**at 8%, fully amortized monthly over 10 years. The purchase price was \$111,500. and the loan**  
**a 70% loan-to-value ratio (LTVR), with the**  
**down payment accounting for the remainder.**

Poor functional utility, northside location, similar square footage to the subject, and a sale closing date two months ago were the other relevant elements of comparison. Boyd believes the owner inflated the sales price of this comparable to compensate for having to carry the financing.

A1-1

Comparable #2: Another fee simple sale financed by an institutional lender at a market rate, the sales price was \$106,250., the functional utility poor, and the square footage was 1692. It is located on the north side of town and Boyd feels that a downward conditions of sale adjustment of 5%

is

needed because the buyer was under pressure to negotiate the purchase quickly after having relocated from outside the area to begin a new job. It sold four months ago.

Comparable #3: Average functional utility, southside location, market financing by an institutional lender,

and

having sold recently make this comparable similar to the subject. It is bigger, however, at 2155 square feet and the buyer purchased the leased fee interest in the property. Sales price was \$110,800.

Comparable #4: This was also a leased fee sale and one in which an institutional lender carried the financing at market terms. It is in a southside location and has average functional utility. Square footage for the house is 1954 and there were no unusual conditions of sale when this property sold six months ago for \$101,000.

Boyd carefully considers the market in which these comparable sold, studies other sales, discusses the peculiarities of this appraisal with

her

colleagues, and then decides upon these adjustments:

- Leased fee to fee simple: +5%

- Market conditions: +0.5% per month (appreciation)
- Northside to southside: +3%
- Square footage: \$25. per square foot difference
- Poor to average functional utility: +2%

The financing adjustment required for Comparable #1 demands Appraiser Boyd's best professional consideration. She would much

A1-2

prefer to use paired data set analysis in arriving at her adjustment

for

this financing difference. Unfortunately, although there have been some recent sales financed by owners, there are not enough that are similar to the subject to draw meaningful comparisons. So, Boyd decides to use a discounting technique for deriving her financing adjustment in which she is going to assume that the owner inflated

the

purchase price of the property to recapture the loss associated with below-market financing that characterized this sale. Boyd uses the current market rate of 12% to discount the 10-year monthly income stream the owner is expected to receive. The calculated loss - that is, the difference between the face amount of the loan and the market value of it - will be the downward financing adjustment.

You will need two constants from the compound/discount tables in order to calculate the financing adjustment:

1. To calculate the loan payment, multiply the loan amount by the loan constant of .012133, which is in Column 6 of the 8% monthly tables, 10-year row.
2. To discount the loan payment at the market rate, multiply the loan payment by the factor of 69.700522, which is in Column 5 of the 12% monthly tables, 10-year row.

The financing adjustment can also be calculated by using a financial calculator.

Assignments:

1. Follow in Boyd's footsteps and adjust the comparables to the subject property, calculating the adjusted sales price for each.
2. Calculate the following for each of the comparables:
  - Net adjustment
  - Percent net adjustment
  - Gross adjustment
  - Percent gross adjustment
3. Conduct your own reconciliation and come up with your opinion of value for the subject property.

Note: An adjustment grid appears on the next page.

<u>Element of comparison</u>	<u>Subject</u>	<u>Comp#1</u>	A1-3 <u>Comp#2</u>	<u>Comp#3</u>	<u>Comp#4</u>
------------------------------	----------------	---------------	-----------------------	---------------	---------------

Sales price:

\_\_\_\_\_  
Adjustment:

\_\_\_\_\_  
Adjustment:

\_\_\_\_\_  
Adjustment:

\_\_\_\_\_  
Adjustment:

\_\_\_\_\_  
Adjustment:

\_\_\_\_\_

**Adjustment:**

\_\_\_\_\_  
**Adjustment:**

\_\_\_\_\_  
**Net adjustment:**

**% net adjustment:**

**Gross adjustment:**

**% gross adjustment:** \_\_\_\_\_

**Adjusted sales price:** \_\_\_\_\_

A1-4

**PROBLEM SOLVING IN RESIDENTIAL REAL ESTATE**  
**APPRAISING QUIZ #1**

**Use the answer sheet on the page following question #10 to record your answers.**

**All questions refer to Appraisal #1.**

- 1. What is the adjusted sales price for comparable #1, to the nearest \$500.?**
  - a. \$105,000.**
  - b. \$105,500.**
  - c. \$106,000.**
  - d. \$106,500.**
  
- 2. What is the adjusted sales price for comparable #2, to the nearest \$500.?**
  - a. \$112,500.**

- b. \$113,000.
- c. \$113,500.
- d. \$114,000.

**3. What is the adjusted sales price for comparable #3, to the nearest \$500.?**

- a. \$108,000.
- b. \$108,500.
- c. \$109,000.
- d. \$110,000.

**Q1-1**

**4. What is the adjusted sales price for comparable #4, to the nearest \$500.?**

- a. \$106,000.
- b. \$106,500.
- c. \$107,000.
- d. \$109,000.

**5. What is the percentage gross adjustment for comparable #1, to the nearest percent?**

- a. 13%
- b. 14%
- c. 15%
- d. 16%

6. What is the percentage gross adjustment for comparable #2, to the nearest percent?
- a. 13%
  - b. 14%
  - c. 15%
  - d. 16%
7. Which of the following are interests in real property that may be appraised?
- a. Fee simple
  - b. Leased fee
  - c. Leasehold
  - d. All of the above

Q1-2

8. A financing adjustment may be calculated by subtracting the present value of a loan from its:
- a. Property value.
  - b. Total of principal and interest paid over the life of the loan.
  - c. Face amount.
  - d. Total interest paid over the life of the loan.
9. Percentage property adjustments are calculated on the sales price of the comparable adjusted through:
- a. Property rights conveyed.
  - b. Financing.

- c. Conditions of sale.
- d. Market conditions.

10. What is paired data set analysis used to estimate?

- a. Magnitude of adjustments
  - b. Mortgage constant
  - c. Sequence of transactional adjustments
  - d. Sequence of property adjustments
- 

Q1-3

**PROBLEM SOLVING IN RESIDENTIAL REAL ESTATE**  
**APPRAISING**

**ANSWER SHEET**

Put the letter - 'a,' 'b,' 'c,' or 'd' - of your answer choice for each of the questions numbered below.

**QUIZ #1**

- 1.
- 2.
- 3.

- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

#### Q1-4

**Appraisal #2: Appraiser Johnston has accepted an assignment to value a single-family home from a client embroiled in litigation over a government agency's efforts to purchase the home through a condemnation action.**

**He expects to be called to testify in court and plans to be as thorough as possible in the appraisal, carefully documenting everything he does.**

**Johnston is using the cost approach and, from comparable sales, has concluded the land is worth in the range of \$13,000. to \$16,000. But, he is uncertain in this valuation and decides to use three other land valuation methods in an attempt to confirm what he thinks he has gotten so far with the sales comparison approach in valuing the land.**

him  
has  
after

First, Johnston turns to the allocation method for valuing land. He has been fortunate enough to obtain sales information that allows to compare prices of unimproved land with that same land after it been improved with a single-family home typical of the kind developers are building in the market. Johnston plans to use the information below - detailing the sales prices of land before and improvement - to decide upon land value as a percent of improved sales price:

<u>Comparable</u>	<u>Unimproved land</u>	<u>Improved land</u>
#1	\$13,500.	\$96,250.
#2	\$17,000.	\$114,000.
#3	\$14,500.	\$104,500.
#4	\$15,000.	\$100,000.
#5	\$19,000.	\$111,500.

Comparables

This method see that

In determining an overall percentage, Johnston weights #1, #2, and #3 at 15% each, Comparable #4 at 30%, and Comparable #5 at 25%, when comparing the relevance of each to the subject. This weighted average is Johnston's conclusion from the allocation for land value as a percent of the sales price for an improved property of the kind that Johnston is considering. He will then apply this percentage to his final opinion of value for his subject property to if he can confirm his opinion of value for the land component only he derived by the use of the other methods of land valuation.

#### A2-1

Next is the extraction method of land valuation. This involves extensive data on recent improved property sales, building costs, and

use  
 depreciation. Johnston has selected four comparables he plans to  
 in order to extract the land value. To do so, he will estimate the  
 replacement cost for the improvements new and then estimate those  
 age- improvements' current depreciation using the modified economic  
 depreciated life method for estimating depreciation. After finding the  
 value of the improvements, he will subtract that value from the  
 property sales price in order to derive the land value. He plans to  
 express that value per square foot, because there is some variance in  
 lot size among the comparables.

land: The four comparables used in the extraction method for valuing

**Comparable #1:** Property sales price was \$99,000., with the  
 replacement cost for the improvements  
 estimated at \$101,500. The curable depreciation  
 is put at 10% of the replacement cost, the total  
 economic life at 50 years, and the effective age  
 5 years. The lot size is 6,100. square feet.

Appraiser Johnston's land valuation using the  
 above comparable would proceed as follows:

\$101,500.	replacement cost
<u>x .10</u>	
\$ 10,150.	curable depreciation

\$101,500.	
<u>- 10,150.</u>	
\$ 91,350.	potential incurable depreciation

$\$91,350. \div 50 \text{ years} = \$1,827. \text{ per year}$

\$1,827. per year	
<u>x 5 years</u>	effective age
\$9,135	incurable depreciation

\$10,150.	curable depreciation
-----------	----------------------

**+ 9,135.** incurable depreciation  
**\$19,285.** total accrued depreciation

**A2-2**  
**\$101,500.** replacement cost new  
**- 19,285.**  
**\$ 82,215.** depreciated value of the improvements

**\$99,000.** property value  
**-82,215.** improvements value  
**\$16,785.** land value

**\$16,785 ÷ 6,100. square feet =**  
**\$2.75 per square foot land value**

**Johnston will calculate land value in the same way for each of the three comparables below and weight all four as described below to reconcile to an opinion of land value using this extraction method.**

**Comparable #2: This property sold for \$87,000. and the improvements' replacement cost is estimated at \$94,000. Curable depreciation is thought to be 15% of the replacement cost, the total economic life 50 years, and the effective age 7 years. Lot size here is 6,430. square feet.**

**Comparable #3: Sales price for the property was \$93,750. Replacement cost for the improvements is estimated at \$90,250. and curable depreciation**

is

**put at 5% of that replacement cost figure. Total economic life is 50 years and effective age 3 years. The lot is 5,119. square feet.**

**Comparable #4: \$88,000. was the property sales price and \$97,000. is the estimate for the replacement cost of the improvements. Curable depreciation is placed at \$10,000., with a total economic life of 50 years and effective age of 8 years. Lot size is right at 6,000. square feet.**

**Appraiser Johnston decides to take a weighted average for these**

comparables

extraction method results. Balancing the closeness of the

which

to his subject, he chooses to weight the value per square foot of Comparables #1 and #2 at 15% each and Comparables #3 and #4 at 35% each. The resulting land value per square foot, weighted as indicated, is going to be one of two land valuation techniques on

### A2-3

the

Johnston plans to rely. The other, derived from the subdivision development method for valuing land and expressed as value per square foot, will be weighted equally with that obtained from the extraction method. Johnston hopes this will confirm what he earlier concluded for land value using the sales comparison method. If this does stand up, his final confirmation for land value will come with applying the land value ratio obtained in the allocation method to

how

subject property valuation. If this resulting valuation is in line with the other land valuation techniques, Johnston will feel secure in

he has valued the land.

is

In order to value the land using the subdivision development method, Appraiser Johnston turns to a recently begun 80-home subdivision project where the first homes just sold in what the developer is estimating will be a two-year marketing period. Johnston feels land value in the subdivision is a good indication of what his subject land

shown

worth and convinces the subdivision developer to share not only cost and profit figures with him but also projected sales revenues, as

below:

- Labor and material costs per house: \$61,600.

- Construction financing: 100% of housing labor and

materials

financed at 9% compounded monthly, no amortized payments but all principal and interest due and payable in one year, 1.5 point loan fee due at origination - calculate the total principal and interest

the due by multiplying the loan amount by  
compound factor of 1.093807 (from  
Column 1, 9% monthly tables, one-year  
row) or use a financial calculator

day - Security for construction site from 6:00 p.m. to 6:00 a.m. each  
for 365 days provided by one watchman who is paid (total  
compensation) \$6.75 per hour

of - Sales commissions for marketing personnel: 3.5% of sales price  
house

- Total professional fees for appraisal, engineering, surveying:  
\$600. per house

- Administrative costs: 1% of sales price of house  
A2-4

- Long term financing: 30-year fixed at 0.5% below-market  
interest rate; developer pays 4 points for  
the buydown for each loan, which is at an  
80% loan-to-value ratio

- Entrepreneurial profit: \$13,400. per house

each Sales price for each of the 80 homes is \$109,000. Total lot size for  
property is 6,000. square feet. The developer is projecting an even  
absorption rate over the two-year marketing period and Johnston  
believes that a 15% discount rate is appropriate for this absorption  
period, discounted on an annual basis. Johnston is going to add up

the total costs and profit figures for this subdivision and deduct that sum  
from the total projected sales revenues to calculate the dollars the  
market will pay for the land. He will then discount these land

dollars under the conditions described above (15% annual rate over an even  
absorption period of two years) by multiplying the annual sales

dollars paid for land by the discount factor of 1.625709 (from the 15% annual  
compound/discount tables, Column 5, two-year row). A financial

**Johnston**

**calculator can also be used to discount the land sales dollars.**

**reconcile**

**will weight equally the values per square foot obtained from the extraction and subdivision development methods in order to**

**to an overall opinion of land value for his subject.**

**for**

**In order to estimate the replacement cost for his subject improvements, Johnston comes up with three benchmark homes that have been built recently and which the appraiser feels are suitable**

**comparison to his subject. He decides upon these cost data:**

**- \$48. per square foot for living area, which is 1986 square feet**

**- \$15. per square foot for the garage, which is 180 square feet**

**and,**

**Estimating depreciation proves to be more of a problem for Johnston than the replacement cost figures shown above. Johnston always approaches depreciation estimates most carefully and makes the decision in this assignment to calculate depreciation using the economic age-life method, the modified economic age-life method,**

**finally, the observed condition/breakdown method.**

**and**

**He places the total economic life for the improvements of his subject at 50 years, the effective age at 6 years (the actual age is 8 years),**

**physical curable depreciation at \$8,000. He believes that correcting**

**A2-5**

**the curable depreciation would lengthen the total economic life to 55 years and reduce the effective age to 3 years.**

**age**

**In using the observed condition/breakdown method, Johnston notes that, in addition to the curable depreciation, there is some incurable physical deterioration for long-lived components. To estimate this, Johnston will use the total economic life of 50 years and effective**

**for**

**of 6 years. The only other source of depreciation Johnston records**

**use in this method is some external obsolescence stemming from the proximity of the house to a relatively busy roadway. He employs**

paired data set analysis to come up with a \$1,500. loss due to this cause. He does not believe he should penalize the land for any portion of this loss and so takes the building-to-property ratio indicated by his allocation method for valuing land to penalize only the improvements for this external obsolescence.

Johnston figures the numbers obtained from the observed condition/breakdown method will be the most reliable. So, he plans to weight this estimate at 50% and those estimates obtained from economic age-life and modified economic age-life at 25% each to reconcile to his final conclusion for depreciation.

**Assignments:**

1. Go with Appraiser Johnston on this valuation of his subject and see if you can come up with what he finds for:
  - a. Land value if the subject lot is 5,800. square feet.
  - b. Replacement cost for the improvements.
  - c. Accrued depreciation.
  - d. Depreciated value of the improvements.
  - e. Property value.

Ensure you adhere to his precise methodology as it has been described.

2. Critique Johnston's strategy for this appraisal and detail what you might have done differently. Address especially all of the following:

**A2-6**

- a. The methods of land valuation, their appropriateness for this appraisal, and the manner in which Johnston used these methods in concert with

**one another**

- b. The reliability of each of the land valuation methods under the circumstances Johnston faced and when you believe each of these methods is particularly useful**
  - c. Johnston's use of the allocation method**
  - d. Other costs that Johnston might have taken into account when employing the subdivision development method for valuing land (one area to study is the financing)**
  - e. Method for estimating replacement cost for the subject improvements**
  - f. Depreciation**
    - (1) Tactics for estimating**
    - (2) Could Johnston have done more?**
    - (3) Reconciliation of separate depreciation estimates**
- 3. Discuss when the cost approach is more - or less - reliable in valuing real property than either the sales comparison or income capitalization approach. Reference your discussion to each of the major types of property encountered in appraisal work.**
-

**PROBLEM SOLVING IN RESIDENTIAL REAL ESTATE**  
**APPRAISING QUIZ #2**

**Use the answer sheet on the page following question #10 to record your answers.**

**All questions refer to Appraisal #2.**

- 1. What does the allocation method indicate the subject land is as a percentage of property value, to the nearest percent?**
  - a. 15%**
  - b. 16%**
  - c. 17%**
  - d. 18%**
  
- 2. What is the subject land value per square foot as indicated by the extraction method, to the nearest \$.20?**
  - a. \$2.20**
  - b. \$2.40**
  - c. \$2.60**
  - d. \$2.80**
  
- 3. What is the subject land value per square foot as indicated by the subdivision development method, to the nearest \$.20?**
  - a. \$2.20**
  - b. \$2.40**
  - c. \$2.60**
  - d. \$2.80**

**Q2-1**

- 4. What is the replacement cost for the subject improvements, to the nearest \$1,000.?**
- a. \$95,000.**
  - b. \$96,000.**
  - c. \$97,000.**
  - d. \$98,000.**
- 5. What is the accrued depreciation of the subject improvements as indicated by the economic age-life method, to the nearest \$1,000.?**
- a. \$12,000.**
  - b. \$13,000.**
  - c. \$15,000.**
  - d. \$20,000.**
- 6. What is the accrued depreciation of the subject improvements as indicated by the modified economic age-life method, to the nearest \$1,000.?**
- a. \$12,000.**
  - b. \$13,000.**
  - c. \$15,000.**
  - d. \$20,000.**
- 7. What is the accrued depreciation of the subject improvements as indicated by the observed condition/breakdown method?**

a. \$12,000.

b. \$13,000.

Q2-2

c. \$15,000.

d. \$20,000.

8. What is the value of the subject property, to the nearest \$500.?

a. \$93,500.

b. \$94,500.

c. \$95,500.

d. \$96,500.

9. In which land valuation method is the depreciated value of the improvements deducted from the property value to give an opinion of the land value?

a. Allocation

b. Extraction

c. Subdivision development

d. All of the above

10. The effective age of the improvements must be estimated in applying which of the following methods of estimating accrued depreciation?

a. Economic age-life

b. Modified economic age-life

c. Both of the above

d. None of the above

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Q2-3  
**PROBLEM SOLVING IN RESIDENTIAL REAL ESTATE**  
**APPRAISING**

**ANSWER SHEET**

Put the letter - 'a,' 'b,' 'c,' or 'd' - of your answer choice for each of the questions numbered below.

**QUIZ #2**

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

**Q2-4**

**Appraisal #3: Appraiser Van Dorn has conducted a market study on 1-4 family residential rentals and has found representative comparables for each**

**type of property as shown below:**

	<u>Single-family</u>	<u>Duplex</u>	<u>Triplex</u>	<u>Quadraplex</u>
<b>Sales Price:</b>	<b>\$81,750.</b>	<b>\$112,000.</b>	<b>\$125,000.</b>	<b>\$132,500.</b>
<b>PGI:</b>	<b>\$14,900.</b>	<b>\$23,100.</b>	<b>\$26,000.</b>	<b>\$27,350.</b>
<b>V&amp;C:</b>	<b>4%</b>	<b>7%</b>	<b>8%</b>	<b>10%</b>
<b>OE:</b>	<b>\$5,579.</b>	<b>\$8,808.</b>	<b>\$10,764.</b>	<b>\$10,584.</b>

**Van Dorn believes each of the above comparables truly reflects its market\* and is going to calculate the following four capitalization rates as indicated by the data for each one:**

- 1. Gross rent multiplier**
- 2. Potential gross income multiplier**
- 3. Effective gross income multiplier**
- 4. Capitalization rate by division**

**\*Note to student: When you do this in the field, of course, you will want to analyze at least three or four comparables for each subject valuation and reconcile to the**

capitalization rates that you will use in your valuation. We are trying to emphasize the process of calculating the rates themselves, and hence use just one comparable to represent the market in order to calculate a rate.

For the single-family home market, therefore, Van Dorn derives the capitalization rates as shown below, using the single-family comparable:

$$\begin{aligned}\text{GRM} &= \text{SP} \div \text{MGR} \\ &= \$81,750. \div 1,242. \text{ (1/12th of PGI)} \\ &= \text{A3-1} \\ &= 66 \text{ (rounded)}\end{aligned}$$

$$\begin{aligned}\text{PGIM} &= \text{SP} \div \text{PGI} \\ &= \$81,750. \div 14,900. \\ &= 5.49\end{aligned}$$

$$\begin{aligned}\text{EGIM} &= \text{SP} \div \text{EGI} \\ &= \$81,750. \div 14,304. \text{ (PGI adjusted downward by 4\%)} \\ &= 5.72\end{aligned}$$

$$\begin{aligned}\text{R} &= \text{I} \div \text{V} \\ &= \$8,725.* \div 81,750. \\ &= .1067 = 10.67\%\end{aligned}$$

\*\$14,304. (EGI) - 5,579. (OE)

Van Dorn is working on an appraisal assignment to value the following four properties, using one multiplier and the capitalization rate by division, derived from market analysis for each subject:

1. Subject single-family home has a potential gross income of



**- 6,091.**  
**NOI: \$ 9,137.**

**Van Dorn will similarly value the other three subjects, in each case selecting one multiplier and the capitalization rate by division to arrive at two valuations per subject. He will derive the capitalization rates from the comparables and value the appropriate subject, continuing from the above valuation for the single-family home to calculate the capitalization rates from the duplex comparable and**

**then**

**use them to value the duplex subject. He will follow the same methodology for valuing the triplex and quadraplex subjects.**

**Assignments:**

- 1. Conduct the market analysis described above for Appraiser Van Dorn and calculate the four indicated capitalization rates from the duplex comparable, the four rates from the triplex comparable, and the four rates from the quadraplex comparable.**

**A3-3**

- 2. Select one multiplier and the capitalization rate by division from each of the other three comparables and value the corresponding subject using those rates.**
  - 3. For each pair of valuations of the four subjects offer your analysis of the relevance of the two appraisals and reconcile to a final opinion of value.**
-

A3-4

**PROBLEM SOLVING IN RESIDENTIAL REAL ESTATE**  
**APPRAISING QUIZ #3**

**Use the answer sheet on the page following question #10 to record your answers.**

**All questions refer to Appraisal #3.**

- 1. What is the operating expense ratio of the comparable single-family home, to the nearest percent?**
  - a. 36%**
  - b. 39%**
  - c. 42%**
  - d. 45%**

**2. What is the potential gross income multiplier as indicated by the duplex comparable, to the nearest .01?**

**a. 4.75**

**b. 4.85**

**c. 4.95**

**d. 5.10**

**3. What is the effective gross income multiplier as indicated by the triplex comparable, to the nearest .01?**

**a. 4.93**

**b. 5.03**

**c. 5.13**

**d. 5.23**

**Q3-1**

**4. What is the capitalization rate by division as indicated by the quadraplex comparable, to the nearest .01%?**

**a. 10.29%**

**b. 10.39%**

**c. 10.49%**

**d. 10.59%**

**5. What is the value of the subject duplex as valued by its effective gross income, to the nearest \$1,000.?**

- a. \$131,000.
- b. \$133,000.
- c. \$135,000
- d. \$137,000.

6. What is the value of the subject triplex as valued by its effective gross income, to the nearest \$1,000.?

- a. \$118,000.
- b. \$120,000.
- c. \$124,000.
- d. \$126,000.

7. What is the value of the subject quadraplex as valued by its potential gross income, to the nearest \$1,000.?

- a. \$119,000.
- b. \$130,000.

Q3-2

- c. \$143,000.
- d. \$151,000.

8. What is the value of the subject quadraplex as indicated by its net operating income, to the nearest \$1,000.?

- a. \$102,000.
- b. \$111,000.

c. \$122,000.

d. \$135,000.

9. What is the relationship of the operating expense ratio and the net income ratio?

a. Reciprocals

b. Complements

c. The two add up to 100%.

d. Both 'b' and 'c'

10. Real property taxes and hazard insurance are typically considered to be:

a. Fixed expenses.

b. Variable expenses.

c. Reserves for replacements.

d. All of the above.

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Q3-3

**PROBLEM SOLVING IN RESIDENTIAL REAL ESTATE**  
**APPRAISING**

**ANSWER SHEET**

Put the letter - 'a,' 'b,' 'c,' or 'd' - of your answer choice for each of the questions numbered below.

## **QUIZ #3**

- 1.
- 2.
- 3.
- 4.
- 5.
- 6.
- 7.
- 8.
- 9.
- 10.

**Q3-4**