Wisconsin Department of

Revenue

Wisconsin Assessor Certification Exam Study Materials

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I. Overview

State law requires certification of all individuals who complete assessment functions. State certification establishes a uniform, minimum, knowledge standard for these individuals.

Exams are provided by Pearson Vue at several locations. Exam are between 1-2 hours with 50-100 multiple choice questions. See Exam Content by Level on the next page. A passing score is correctly answering 70 percent or more of the questions. After registering for an exam, you will receive information on the exam day process including the required identification (driver's license) you must bring with you to the exam. Read the information carefully. A calculator and scratch paper are provided along with hearing protection for a quiet test-taking experience.

The following materials will help you prepare for an exam.

A. Exam Content by Level

Topic	Number of Questions				
	Assessment Technician	Property Appraiser	Assessor 1	Assessor 2	Assessor 3
Math	20	5	1	0	0
Statistics	0	0	3	12	14
Legal description	10	11	8	5	0
Construction	8	7	9	13	0
Law	12	13	51	29	21
Appraisal	0	14	28	41	25
Administration	0	0	0	0	40
Total questions	**50**	**50**	**100**	**100**	**100**
Completion time	1 hour	1 hour	2 hours	2 hours	2 hours

B. Assessor Certification Exam Study Material

Topic	Source
Statistics	• WPAM Vol. I – Chapter 10 • WPAM Vol. 2 – Mathematics in Appraising • Property Assessment Valuation: Mass Appraisal (IAAO)
Building construction terms	WPAM Vol. I – Glossary – Architectural and Construction Terms
Construction and grading	WPAM Vol. 2 – Chapters 1, 2, 3
Law	WPAM Vol. I – Chapter 2 – Assessor Certification, Chapter 4 – Dates Governing Assessment, Chapter 7 – Legal Descriptions and Assessment Classification, Chapter 8 – Data Collection and Reporting, Chapter 14 – Agricultural Classification and Conversion Charge, Chapter 16 – Managed Forest Land • Wisconsin Statutes Chapter 70 • Wisconsin Statutes Chapter 73 • Wisconsin Statutes Chapter 74 • Wisconsin Chapter Tax 12 • Wisconsin Chapter Tax 18 • Property Assessment Appeal Guide for Wisconsin Real Property Owners
Legal descriptions	WPAM Vol. I – Chapter 7
Appraisal	WPAM Vol. I – Chapters 9, 12, 13, 17, Glossary – Statistical and Appraisal Terms

C. Additional Resource Materials to Review

Materials include:
- WPAM, Volumes I and 2
- Property Assessment Valuation (IAAO)
- Property Appraisal and Assessment Administration (IAAO)
- The Appraisal of Real Estate 9th Ed. (Appraisal Institute)
- The Appraisal of Rural Property (Appraisal Institute)
- Appraising Residential Properties (Appraisal Institute)
- Real Estate Appraisal Terminology (Appraisal Institute)
- Income Property Valuation (Kinnard)
- Fundamentals of Land Measurement (J.S. Hoag)
- Encyclopedia of Real Estate Appraisal (E.J. Friedman)
- Math texts (basic math including fractions, decimals, percentages, areas and ratios)
- Management texts (ex: IAAO Course 400 – Assessment Administration) containing information on project planning, budget policies, general supervision and management, development of personnel and assessment administration

D. Assessment Cycle Timetable – See WPAM Chapter 4

Dates	Items
January 1	• Statutory assessment date • Statement of personal property forms sent
March 1	Due date of Statement of Personal Property and Exemption forms
Seven days before the fourth Monday in April	Open Book can occur any time prior to seven days before the fourth Monday in April. Assessment roll is then completed and submitted to the Municipal Clerk.
April – Fourth Monday	Assessor signs affidavit in assessment roll and attends BOR BOR must meet during the 45-day period beginning the fourth Monday in April. If the initial Municipal Assessment Report (MAR) was estimated, a final version must be filed within 10 days of the completion of the BOR.
August 15	Final Equalized Values released
December 1	Final MAR must be submitted
More important dates	Can be found by reviewing the Property Assessment Guide for Municipal Officials and the WPAM, Ch. 4, 11-28

II. Assessment Technician /Property Appraiser

A. Math Principles

1. **Ratio of acres to miles**
   - 640 acres = 1 square mile

2. **Determine cubic yards**
   - A. Calculate area
   - B. Calculate volume (multiply area x depth = volume in cubic feet)
   - C. Divide cubic feet by 27 to convert to cubic yards

3. **Determine cubic inches**
   - A. Measure the length, width and depth of the object in inches
   - B. Multiply the length by the width
   - C. Multiply the answer to (B) by the depth
   - D. Write the final answer in cubic inches

4. **Calculate square footage**
   - Calculate area (for square or rectangle=length x width)

5. **Calculate cost per square footage**
   - Divide price by total square feet = cost per square foot

6. **Solve basic algebraic equations**
   - ex: 2x+4 = 10

B. Legal Description – Sample Questions

Review the **WPAM Glossary** for a list of terms and definitions.

1. **The Principal Meridian governing rectangular surveys in the State of Wisconsin is:**
   - A. First Principal Meridian
   - B. Illinois-Wisconsin Principal Meridian
   - C. Fourth Principal Meridian
   - D. Wisconsin Principal Meridian

2. **The standards of parallel (standard parallels) are:**
   - A. North-South lines
   - B. Six miles apart
   - C. Sixty miles apart in Wisconsin
   - D. True North lines

3. **Townships are:**
    A. Subdivided into tiers and ranges
    B. Twenty-four by twenty-four miles in size
    C. Subdivided into thirty-six sections
    D. One square miles in size

4. **The basic unit of length in the public-land survey is:**
    A. The Gunter's "chain" of 66 feet or 100 links
    B. The meter
    C. The square root
    D. The square mile

5. **The initial point of the Wisconsin public-land survey is:**
    A. Junction point of the Mississippi River and the Wisconsin-Illinois line
    B. Junction point of Wisconsin-Illinois line and Lake Michigan
    C. Junction of four section corners found under the State Capitol building in Madison
    D. Junction point of the Fourth Principal Meridian and Wisconsin-Illinois line boundary

6. **In the rectangular government survey townships and sections are located with respect to:**
    A. The plane coordinate system
    B. The national triangulation net
    C. The principal meridian and base line
    D. The meander line of fractional parallelism

7. **The E-W axis of a government land survey is:**
    A. Principal meridian
    B. Base line
    C. Section line
    D. Line of longitude

8. **Each township established by the public-land surveys is divided into:**
    A. Four sections
    B. Thirty-six sections
    C. Assessors plats
    D. Coordinate grid systems

9. **The N-S axis of a government land survey establishing an initial point is:**
    A. Section line
    B. Base line
    C. Principal meridian
    D. Line of latitude

10. Fractional section caused by the curvature of the earth and correction of errors of measurement are located on the _____ and _____ borders of the township.
    A. North and South
    B. North and East
    C. North and West
    D. East and West

11. The point marked by the intersection of the regular section line and the mean high-water mark of a body of water is:
    A. Government lot
    B. Meander corner
    C. Parcel identifier
    D. Range line

Legal Description – Answers

1. The Principal Meridian governing rectangular surveys in the State of Wisconsin is:
   - A. First Principal Meridian
   - B. Illinois-Wisconsin Principal Meridian
   - **C. Fourth Principal Meridian**
   - D. Wisconsin Principal Meridian

2. The standards of parallel (standard parallels) are:
   - A. North-South lines
   - B. Six miles apart
   - **C. Sixty miles apart in Wisconsin**
   - D. True North lines

3. Townships are:
   - A. Subdivided into tiers and ranges
   - B. Twenty-four by twenty-four miles in size
   - **C. Subdivided into thirty-six sections**
   - D. One square miles in size

4. The basic unit of length in the public-land survey is:
   - **A. The Gunter's "chain" of 66 feet or 100 links**
   - B. The meter
   - C. The square root
   - D. The square mile

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   - A. Junction point of the Mississippi River and the Wisconsin-Illinois line
   - B. Junction point of Wisconsin-Illinois line and Lake Michigan
   - C. Junction of four section corners found under the State Capitol building in Madison
   - **D. Junction point of the Fourth Principal Meridian and Wisconsin-Illinois line boundary**

6. In the rectangular government survey townships and sections are located with respect to:
   - A. The plane coordinate system
   - B. The national triangulation net
   - **C. The principal meridian and base line**
   - D. The meander line of fractional parallelism

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   - A. Principal meridian
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10. **Fractional section caused by the curvature of the earth and correction of errors of measurement are located on the _____ and _____ borders of the township.**
    A. North and South
    B. North and East
    C. North and West
    D. East and West

11. **The point marked by the intersection of the regular section line and the mean high-water mark of a body of water is:**
    A. Government lot
    B. Meander corner
    C. Parcel identifier
    D. Range line

C. Construction Terms

Review the WPAM Glossary for a list of construction terms and definitions.

Dwelling style
Be able to identify the different style of buildings; ranch, bi-level, split-level, cape cod, bungalow, cottage, craftsman, prairie, basic single story, farmhouse, Victorian, colonial, contemporary, modern single-story, modern multi-story, executive mansion, condo, town house, duplex, apartment, manufactured, and other. Review WPAM V2, pages 2-3 to 2-5 and 3-6 to 3-64.
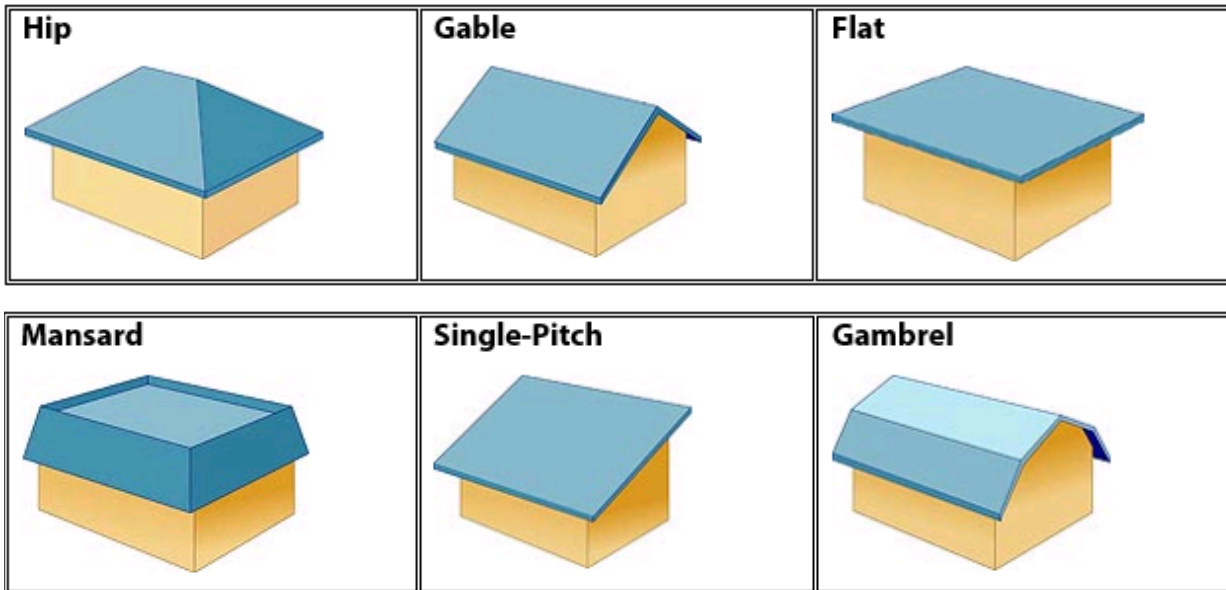
Construction grade
Grade A, B, C, D and E determine the quality of craftsmanship, architecture, features, quality of the heating and cooling.

Roof type

Hip	Gable	Flat

Mansard	Single-Pitch	Gambrel

Provide the term for each definition

1. Wall which supports any vertical load in a building as well as its own weight

2. Vertical structural member to support horizontal members and transmit load to bearing material at column base

3. Vertical wood or metal framing member to which horizontal boards or laths are nailed, as the supporting elements in walls and partitions

4. Structural system in which the floor and roof loads are carried directly by the exterior walls rather than by a structural framing system

5. Roof whose four sides slope to a common point or to a ridge; has no gable ends

6. Any of the parallel beams that support the subfloor or the ceiling

7. Material used to retard the passage of vapor or moisture into walls and floors, thus preventing condensation

8. Total distance around the outside of a building

9. Unit for measuring heat: a single unit represents the heat necessary to raise the temperature of one pound of water 1 degree Fahrenheit

10. Projecting course at the base of a foundation wall which ties the foundation into the ground to prevent lateral shifting and settling; distributes the superstructure load over a greater area

11. Piece of wood, stone or steel placed horizontally across the top of door and window openings to support the walls above the opening

12. Any moving or variable load applied to a structure, expressed in pounds per square foot of floor and roof areas for various types of building occupancy (e.g., weight of people, merchandise, or stock on a floor; snow load or wind pressure on a roof)

13. One of a series of small parallel beams laid on edge and used to support floor and ceiling loads, and usually supported in turn by larger beams and girders

14. A ridged roof, with sides having two pitches or slopes

Construction Terms – Answers

1. A wall which supports any vertical load in a building as well as its own weight. **Load bearing wall**

2. Vertical structural member to support horizontal members and transmit load to bearing material at column base. **Column**

3. A vertical wood or metal framing member to which horizontal boards or laths are nailed, as the supporting elements in walls and partitions. **Stud**

4. A structural system in which the floor and roof loads are carried directly by the exterior walls rather than by a structural framing system. **Bearing wall**

5. Roof whose four sides slope to a common point or to a ridge; has no gable ends. **Hip**

6. Any of the parallel beams that support the subfloor or the ceiling. **Joist**

7. Material used to retard the passage of vapor or moisture into walls and floors, thus preventing condensation. **Vapor barrier**

8. Total distance around the outside of a building. **Perimeter**

9. Unit for measuring heat: a single unit represents the heat necessary to raise the temperature of one pound of water 1 degree Fahrenheit. **BTU (British Thermal Unit)**

10. Projecting course at the base of a foundation wall which ties the foundation into the ground to prevent lateral shifting and settling; distributes the superstructure load over a greater area **Footing**

11. Piece of wood, stone or steel placed horizontally across the top of door and window openings to support the walls above the opening. **Header**

12. Any moving or variable load applied to a structure, expressed in pounds per square foot of floor and roof areas for various types of building occupancy, e.g., weight of people, merchandise, or stock on a floor; snow load or wind pressure on a roof. **Live load**

13. One of a series of small parallel beams laid on edge and used to support floor and ceiling loads, and usually supported in turn by larger beams and girders. **Joist**

14. A ridged roof, with sides having two pitches or slopes. **Gambrel roof**

III. Assessor 1, 2, 3

A. Statistics 1 Principles

1. **Measures of appraisal level –** calculated statistically by measures of central tendency, which describe the typical level of appraisal by a single number or statistic. Three such measures applicable to ratio studies are the median; the mean; and the weighted mean.

   - **Mean –** average ratio. It is found by summing the ratios and then dividing by the number of ratios. It is an easily calculated average using every ratio in the sample. It is sensitive to extreme ratios and thus may not be typical.

   - **Weighted mean –** an aggregate ratio determined by the following steps:
     » Sum the appraised values for the entire sample
     » Sum the sales prices for the entire sample
     » Divide the total of the appraised values by the total of the sales prices

     It is easily calculated but not as easily understood as the simple mean. It is sensitive to extreme ratios, thus may not be typical. It can be more sensitive than the simple mean. It is an appropriate measure of central tendency for estimating the market value of all property when given a sufficient sample of sales. It measures the level of assessment on a dollar by dollar basis, while the median and simple mean measure on a property by property basis.

   - **Median –** the midpoint, or middle ratio, when the ratios are arrayed in order of magnitude. If there are an odd number of ratios, the median is an actual ratio. If there an even number of ratios, the median is the simple average of the two centrally located ratios. The median divides the ratios into two equal groups and is therefore little affected by extreme ratios. It is a constant stable. The median is a commonly used measure of central tendency for assessment/sales uniformity studies.

   - **Mode –** ratio that occurs most frequently

2. **Price related differential –** as applied to real estate, an analytical measure of the vertical uniformity of values in a given distribution calculated by dividing the mean ratio by the aggregate ratio. The PRD is a statistic for measuring assessment regressivity or progressivity. It is calculated by dividing the mean by the weighted mean. Property appraisals sometimes result in unequal tax burdens between high and low value properties in the same property group. Appraisals are considered regressive if high-value properties are underappraised relative to low-value properties and progressive if high-value properties are relatively overappraised. A PRD greater than 1 suggests that the high-value parcels are underappraised, thus pulling the weighted mean below the mean. On the other hand, if the PRD is less than 1, high-value parcels are relatively overappraised pulling the weighted mean above the mean.

3. **Coefficient of dispersion (COD) –** the most used measure of uniformity in ratio studies. The COD is based on the average absolute deviation, but expresses it as a percentage. It measures the average distance (in relative terms) that individual ratios lie from the median. It is calculated by taking each ratio below the median and subtracting it from the median, then taking each ratio above the median and subtracting the median from it. The result is a series of positive differences (deviations). Total these differences and divide by the total number of sales to obtain the absolute COD. The absolute COD is divided by the median to obtain the relative COD. Thus, the COD provides a measure of appraisal uniformity that is independent of the level of appraisal and permits direct comparisons between property groups. A coefficient of dispersion of less than 10 percent indicates quality assessment performance.

4. **Coefficient of concentration –** measures assessment uniformity. The COC is related to the discussion on the desirability of unimodal frequency distributions centered around the median. It is a percentage of ratios which lie within 15 percent of the median. The COC is a single statistic that summarizes the degree to which assessment/sales ratios bracket the median. The higher the coefficient the better the uniformity.

5. **Ratio studies –** in mass appraisal, the primary tool for performance analysis is the ratio study. Ratio studies measure two primary aspects of mass appraisal accuracy: level and uniformity. A statistical analysis of the distribution of assessment or appraisal-to-sale ratios of a sample of recent sales made for the purpose of drawing inferences regarding the entire population of parcels from which the sample was abstracted.

B. Statistics 1 – Sample Questions

1. What is the mean, median and mode?

Mean	Median	Mode
35	50	65
40	52	67
45	55	70
45	60	73
45	63	75
Mean ?		
Median ?		
Mode ?		

2. What is the mean, median and mode?

Mean	Median	Mode
75	87	95
77	87	98
78	87	100
80	90	101
82	93	105
Mean ?		
Median ?		
Mode ?		

3. Calculate the absolute coefficient of dispersion

Median of the nine ratios	66%								
Ratios	50%	52%	80%	45%	69%	85%	62%	66%	70%
Absolute COD ?									

4. Calculate the relative coefficient of dispersion

Median of the nine ratios	71%								
Ratios		65%	68%	50%	55%	70%	71%	85%	88%	90%
Relative COD ?									

5. Based on the following information, calculate the price related differential and select whether it is regressive or progressive.

Aggregate Ratio	Mean Ratio	Median Ratio
70	78	75
PRD ?		
Progressive or Regressive?		

6. Based on the following information, calculate the price related differential and select whether it is regressive or progressive.

Aggregate Ratio	Mean Ratio	Median Ratio
87	80	86
PRD ?		
Progressive or Regressive?		

Statistics 1 – Answers

1. **What is the mean, median and mode?**

Mean	Median	Mode
35	50	65
40	52	67
45	55	70
45	60	73
45	63	75

Mean ?	56	*Sum of the ratios/number of ratios*
Median ?	55	*Middle ratio when ratios arrayed in order of magnitude (median rank=0.5(n) + 0.5 where "n" is the number of ratios in the sample*
Mode ?	45	*Ratio that occurs most frequently*

2. **What is the mean, median and mode?**

Mean	Median	Mode
75	87	95
77	87	98
78	87	100
80	90	101
82	93	105

Mean ?	89	*Sum of the ratios/number of ratios*
Median ?	87	*Middle ratio when ratios arrayed in order of magnitude (median rank=0.5(n) + 0.5 where "n" is the number of ratios in the sample*
Mode ?	87	*Ratio that occurs most frequently*

3. **Calculate the absolute coefficient of dispersion**

Median of the nine ratios	66%								
Ratios	50%	52%	80%	45%	69%	85%	62%	66%	70%

Absolute COD ?	10.55	*Add the difference between each of the ratios and the median together (e.g., 66-50=16; 66-52=14; |66-80|= 14; etc.) and divide by the number of ratios. 95/9 = 10.55*

4. Calculate the relative coefficient of dispersion

Median of the nine ratios	71%								
Ratios	65%	68%	50%	55%	70%	71%	85%	88%	90%

Relative COD ?	15.18	Add the difference between each of the ratios and the median together and divide by the number of ratios. 97/9 = 10.78 Then divide the absolute COD by the median. 10.78/0.71 = 15.18

5. Based on the following information, calculate the price related differential and select whether it is regressive or progressive.

Aggregate Ratio	Mean Ratio	Median Ratio
70	78	75
PRD ?	1.11	
Progressive or Regressive?		Regressive *Divide the mean by the aggregate ratio (weighted mean) to determine the PRD. If greater than 1, it is regressive.*

6. Based on the following information, calculate the price related differential and select whether it is regressive or progressive.

Aggregate Ratio	Mean Ratio	Median Ratio
87	80	86
PRD ?	0.92	
Progressive or Regressive?		Progressive *Divide the mean by the aggregate ratio (weighted mean) to determine the PRD. If less than 1, it is progressive.*

C. Statistics 2 – Sample Questions

1. **What is the mean, median and mode?**

Mean	Median	Mode
60	75	88
62	79	88
64	85	89
68	87	90
70	88	95

Mean ?	
Median ?	
Mode ?	

2. **What is the mean, median and mode?**

Mean	Median	Mode
20	30	40
24	35	42
24	38	45
27	38	48
28	38	50

Mean ?	
Median ?	
Mode ?	

3. **Calculate the absolute coefficient of dispersion**

Median of the nine ratios	66%								
Ratios	45%	52%	80%	48%	69%	85%	62%	66%	75%
Absolute COD ?									

4. **Calculate the relative coefficient of dispersion**

Median of the nine ratios	70%								
Ratios	65%	68%	50%	55%	70%	71%	85%	88%	90%
Relative COD ?									

5. Based on the following information, calculate the price related differential and select whether it is regressive or progressive.

Aggregate Ratio	Mean Ratio	Median Ratio
60	78	70
PRD ?		
Progressive or Regressive?		

6. Based on the following information, calculate the price related differential and select whether it is regressive or progressive.

Aggregate Ratio	Mean Ratio	Median Ratio
55	65	86
PRD ?		
Progressive or Regressive?		

Statistics 2 – Answers

1. **What is the mean, median and mode?**

Mean	Median	Mode
60	75	88
62	79	88
64	85	89
68	87	90
70	88	95

Mean ?	79	Sum of the ratios/number of ratios
Median ?	85	Middle ratio when ratios arrayed in order of magnitude (median rank=0.5(n) + 0.5 where "n" is the number of ratios in the sample
Mode ?	88	Ratio that occurs most frequently

2. **What is the mean, median and mode?**

Mean	Median	Mode
20	30	40
24	35	42
24	38	45
27	38	48
28	38	50

Mean ?	35	Sum of the ratios/number of ratios
Median ?	38	Middle ratio when ratios arrayed in order of magnitude (median rank=0.5(n) + 0.5 where "n" is the number of ratios in the sample
Mode ?	38	Ratio that occurs most frequently

3. **Calculate the absolute coefficient of dispersion**

Median of the nine ratios	66%								
Ratios	45%	52%	80%	48%	69%	85%	62%	66%	75%

Absolute COD ?	11.33	Add the difference between each of the ratios and the median together and divide by the number of ratios. 102/9 =11.33

4. Calculate the relative coefficient of dispersion

Median of the nine ratios	70%								
Ratios	65%	68%	50%	55%	70%	71%	85%	88%	90%

Relative COD ?	15.23	Add the difference between each of the ratios and the median together and divide by the number of ratios. 96/9 =10.66 Then divide the absolute COD by the median. 10.66/0.7 = 15.23

5. Based on the following information, calculate the price related differential and select whether it is regressive or progressive.

Aggregate Ratio	Mean Ratio	Median Ratio
60	78	70
PRD ?	1.3	
Progressive or Regressive?		Regressive Divide the mean by the aggregate ratio (weighted mean) to determine the PRD. If greater than 1, it is regressive.

6. Based on the following information, calculate the price related differential and select whether it is regressive or progressive.

Aggregate Ratio	Mean Ratio	Median Ratio
55	65	86
PRD ?	1.18	
Progressive or Regressive?		Regressive Divide the mean by the aggregate ratio (weighted mean) to determine the PRD. If greater than 1, it is regressive.

D. Statistics 3 – Sample Questions

1. What are the mean ratio, median ratio and aggregate ratio?

Sale No.	Assessment	Sale Price	Ratio
1	$ 75,000	$ 60,000	125.00
2	$100,000	$125,000	80.00
3	$ 98,000	$ 75,000	130.66
4	$ 80,000	$ 55,000	145.45
5	$ 87,000	$ 95,000	91.59
Mean ratio ?			
Median ratio ?			
Aggregate ratio (weighted mean) ?			

2. What are the mean ratio, median ratio and aggregate ratio?

Sale No.	Assessment	Sale Price	Ratio
1	$ 88,000	$ 80,000	110.00
2	$125,000	$130,000	96.15
3	$ 115,000	$100,000	115.00
4	$ 75,000	$ 60,000	125.00
5	$ 90,000	$ 82,000	109.76
Mean ratio ?			
Median ratio ?			
Aggregate ratio (weighted mean) ?			

3. What are the mean ratio, median ratio and aggregate ratio?

Sale No.	Assessment	Sale Price	Ratio
1	$ 84,000	$ 80,000	105.00
2	$130,000	$115,000	113.04
3	$ 90,000	$ 92,000	97.83
4	$ 100,000	$ 75,000	133.33
5	$ 80,000	$ 95,000	84.21
Mean ratio ?			
Median ratio ?			
Aggregate ratio (weighted mean) ?			

4. What are the mean ratio, median ratio and aggregate ratio?

Sale No.	Assessment	Sale Price	Ratio
1	$ 76,000	$ 80,000	95.00
2	$ 90,000	$110,000	81.82
3	$ 70,000	$ 75,000	93.33
4	$ 80,000	$ 95,000	84.21
5	$ 110,000	$100,000	110.00
Mean ratio ?			
Median ratio ?			
Aggregate ratio (weighted mean) ?			

Statistics 3 – Answers

1. What are the mean ratio, median ratio and aggregate ratio?

Sale No.	Assessment	Sale Price	Ratio
1	$ 75,000	$ 60,000	125.00
2	$100,000	$125,000	80.00
3	$ 98,000	$ 75,000	130.66
4	$ 80,000	$ 55,000	145.45
5	$ 87,000	$ 95,000	91.59
Mean ratio ?	114.54	Sum of the ratios/number of ratios	
Median ratio ?	125.00	Place the ratios in order of magnitude. The median ratio is the middle ratio. To determine the median rank apply the formula 0.5(n) + 0.5 where "n" is the number of ratios in the sample.	
Aggregate ratio (weighted mean) ?	107.32	Assessment/Sales Add all of the assessed values and divide by the sum of the sale prices: 440,000/410,000 = 1.07317 Move decimal two places to the right and round off.	

2. What are the mean ratio, median ratio and aggregate ratio?

Sale No.	Assessment	Sale Price	Ratio
1	$ 88,000	$ 80,000	110.00
2	$125,000	$130,000	96.15
3	$115,000	$100,000	115.00
4	$ 75,000	$ 60,000	125.00
5	$ 90,000	$ 82,000	109.76
Mean ratio ?	111.18	Sum of the ratios/number of ratios	
Median ratio ?	110.00	Place the ratios in order of magnitude. The median ratio is the middle ratio. To determine the median rank apply the formula 0.5(n) + 0.5 where "n" is the number of ratios in the sample.	
Aggregate ratio (weighted mean) ?	109.07	Assessment/Sales Add all of the assessed values and divide by the sum of the sale prices: 493,000/452,000 = 1.09070 Move decimal two places to the right and round off.	

3. **What are the mean ratio, median ratio and aggregate ratio?**

Sale No.	Assessment	Sale Price	Ratio
1	$ 84,000	$ 80,000	105.00
2	$130,000	$115,000	113.04
3	$ 90,000	$ 92,000	97.83
4	$ 100,000	$ 75,000	133.33
5	$ 80,000	$ 95,000	84.21
Mean ratio ?		106.68	*Sum of the ratios/number of ratios*
Median ratio ?		105.00	*Place the ratios in order of magnitude. The median ratio is the middle ratio. To determine the median rank apply the formula 0.5(n) + 0.5 where "n" is the number of ratios in the sample.*
Aggregate ratio (weighted mean) ?		105.91	*Assessment/Sales* *Add all of the assessed values and divide by the sum of the sale prices:* *484,000/457,000 = 1.0590* *Move decimal two places to the right and round off.*

4. **What are the mean ratio, median ratio and aggregate ratio?**

Sale No.	Assessment	Sale Price	Ratio
1	$ 76,000	$ 80,000	95.00
2	$ 90,000	$110,000	81.82
3	$ 70,000	$ 75,000	93.33
4	$ 80,000	$ 95,000	84.21
5	$ 110,000	$100,000	110.00
Mean ratio ?		92.87	*Sum of the ratios/number of ratios*
Median ratio ?		93.33	*Place the ratios in order of magnitude. The median ratio is the middle ratio. To determine the median rank apply the formula 0.5(n) + 0.5 where "n" is the number of ratios in the sample.*
Aggregate ratio (weighted mean) ?		92.61	*Assessment/Sales* *Add all of the assessed values and divide by the sum of the sale prices:* *426,000/460,000=0.92608* *Move decimal two places to the right and round off.*

E. Appraisal 1 – Sample Questions

Example 1

The appraisal assignment is a one-story brick residence containing three bedrooms, one bathroom, a fireplace, central heat and air, and a single-car garage.

The following sales are comparables:

- **Sale 1**– is a one-story brick residence containing four bedrooms, two bathrooms, a fireplace, central heat and air conditioning, and a two-car garage. It sold six months ago for $243,000.

- **Sale 2** – is a one-story brick residence containing three bedrooms, two bathrooms, a fireplace, central heat and air conditioning, and a single car garage. It sold two months ago for $234,000.

- **Sale 3** – is a one-story frame residence containing three bedrooms, one bathroom, central heat and air conditioning, and a single car garage. It is a current sale for $215,000.

Market analysis provided these adjustments	
Fourth bedroom	$12,000
Bathroom	$11,000
Single-car garage	$12,000
Two-car garage	$18,000
Fireplace	$ 3,000
Frame construction *(brick is superior to frame)*	$10,000
Market conditions	1% per month

Example 2

Prepare a lump-sum adjustment grid and estimate the value of the subject property.

	Subject	Sale 1	Sale 2	Sale 3
Sale price		$243,000	$234,000	$215,000
Market conditions adjustment		6%	2%	
Adjusted sale price		$257,580	$238,680	$215,000
Bedrooms	3	-$ 12,000		
Bathrooms	1	-$ 11,000	-$ 11,000	
Fireplace	1			+$ 3,000
Garage	1	-$ 6,000		
Construction	Brick			+$ 10,000
Net adjustments		-$ 29,000	-$ 11,000	+$ 13,000
Adjusted sale price		$228,580	$227,680	$228,000
Indicated value of property	$228,000			
Remember to add the indicated $ if the comparable is deficient and to subtract $ if it is superior.				

1. Which sale is the most comparable to the subject property?

	Subject	Sale 1	Sale 2	Sale 3	Sale 4
Location	North	+10%	+5%	North	+10%
Acres	75	100	125	75	80
Topography	Flat	+10%	+5%	Flat	+10%
Sale date	?	+25%	+8%	+5%	+10%
Sale price	?	$100,000	$120,000	$145,000	$175,000

2. The appraisal assignment is an average-quality, frame, two-story single-family residence, located on a one-acre tract in the Benton subdivision. The residence has three bedrooms, two bathrooms, one fireplace, and a two-car attached garage. It is in average condition.

   The following are comparable sales:
   - **Sale 1** – is an average quality, frame, two-story single-family residence, located on a two-acre tract in Benton subdivision. The residence has three bedrooms, two and one-half bathrooms, one fireplace, and a three-car attached garage. Its condition is good compared to the subject. It sold one year ago for $300,000.

   - **Sale 2** – is a good-quality, frame, two-story single-family residence, located on a one-acre tract in Aspen subdivision. The residence has four bedrooms, two bathrooms, one fireplace, and a three-car attached garage and is in average condition. It sold six months ago for $275,000.

   - **Sale 3** – is an average-quality, brick, two-story single-family residence, located on a one-acre tract in Benton subdivision. The residence has three bedrooms, two and one-half bathrooms, one fireplace, and a two-car attached garage. It is in average condition and is a current sale for $279,000.

Market analysis provided these adjustments	
Fourth bedroom	$12,000
One-half bath	$ 4,000
Third garage stall	$ 8,000
Quality	10%
Good condition	5%
Fireplace	$ 4,000
Brick construction *(brick is superior to frame)*	$10,000
One-acre tract	$50,000
Two-acre tract	$75,000
Location *(Benton is preferred over Aspen)*	10%
Market conditions *(time of sale)*	0.5% per month

What is the indicated value for the subject property?

	Subject	Sale 1	Sale 2	Sale 3
Sale price				
Market conditions adjustment				
Adjusted sale price				
Location	Benton			
Lot size	1 acre			
Bedrooms	3			
Half-bathrooms	None			
Fireplace	1			
Garage	2-car			
Quality	Average			
Condition	Average			
Construction	Frame			
Net adjustments				
Adjusted sale price				
Indicated value of property?				

Appraisal 1 – Answers

1. Sale 3 is the most comparable as it has the least adjustments

	Subject	Sale 1	Sale 2	Sale 3	Sale 4
Location	North	+10%	+5%	North	+10%
Acres	75	100	125	75	80
Topography	Flat	+10%	+5%	Flat	+10%
Sale date	?	+25%	+8%	+5%	+10%
Sale price	?	$100,000	$120,000	$145,000	$175,000

2. What is the indicated value for the subject property?

	Subject	Sale 1	Sale 2	Sale 3
Sale price		$300,000	$275,000	$279,000
Market conditions adjustment		+6% (12 months x .05)	+3% (6 months x .05)	0% (0 months x .05)
Adjusted sale price		$318,000	$283,250	$279,000
Location	Benton	Equal	+$28,325	Equal
Lot size	1 acre	-$25,000	Equal	Equal
Bedrooms	3	Equal	-$12,000	Equal
Half-bathrooms	None	-$4,000	Equal	-$4,000
Fireplace	1	Equal	Equal	Equal
Garage	2-car	-$8,000	-$8,000	Equal
Quality	Average	Equal	-$28,325	Equal
Condition	Average	-$15,900	Equal	Equal
Construction	Frame	Equal	Equal	-$10,000
Net adjustments		-$52,900	-$20,000	-$14,000
Adjusted sale price		$265,100	$263,250	$265,000
Indicated value of property?	$265,000			

F. Appraisal 2 – Sample Questions

1.   What is the square foot value and indicated value for the subject property?

The appraisal assignment is an eight-unit apartment. It is brick construction containing 6,400 square feet, of average quality, and located in Elm subdivision. Its condition is average, and each unit has its own forced air heat with air conditioning. There are two entrances to the building, and each entrance has a security door. There is a fire protection system throughout the building. Also, there is covered parking, and each tenant has one space. Market analysis indicates the sale price per square foot is the most appropriate unit to use in the analysis.

The following are comparable sales:

*   **Sale 1** – is an eight-unit apartment of brick construction containing 6,100 square feet. It is a fair-quality building in Maple subdivision. Its condition is average, and each unit has its own forced-air heat with air conditioning. The two entrances have security doors, and there is a fire protection unit throughout the building. However, there is no covered parking. There is a limited parking area provided on a first-come first-served basis. This property sold six months ago for $480,000.

*   **Sale 2** – is an eight-unit apartment of brick construction containing 7,200 square feet. It is an average-quality building in Elm subdivision. Its condition is average. It has hot-water heat with window air-conditioning units. The two entrances have security doors, but there is no fire protection unit in the building. Also, there is no covered parking. There is a limited parking area provided on a first-come first-served basis. This property sold recently for $570,000.

*   **Sale 3** – is an eight-unit apartment of frame construction containing 5,800 square feet. It is a good-quality building in Elm subdivision. Its condition is fair, and each unit has its own forced-air heat with air-conditioning. The two entrances do not have security doors, but there is a fire protection unit throughout the building. Also, there is no covered parking. There is a limited parking area provided on a first-come first-served basis. This property sold one year ago for $485,000.

Market analysis provided these adjustments, based on the sales price per square feet *(adjusted for market conditions)*	
Market conditions *(time adjustment)*	0.0025 per month
Heating and cooling *(hot water heat with window air conditioning less desirable))*	10%
Quality	10%
Condition	5%
Security doors *(two)*	5%
Fire protection	5%
Location *(Maple is less desirable than Elm)*	5%
Construction *(brick is preferred over frame)*	5%
Parking	5%

	Subject	Sale 1	Sale 2	Sale 3
Sale price				
Market conditions adjustment				
Market adjusted sale price				
Area *(square feet)*	6,400			
Sale price per square foot				
Heating and cooling	Yes			
Quality	Average			
Condition	Average			
Security doors *(two)*	Yes			
Fire protection	Yes			
Location	Elm			
Construction	Brick			
Parking	Covered			
Net adjustments				
Adjusted sale price per sq. ft.				
Sq. ft. value for subject property?				
Indicated value for subject property?				

2. Based on the given information, answer the following three questions.
   A. What are the time adjustments for Sale 1 and 2?
   B. What are the age adjustments for Sale 1 and 2?
   C. What are the adjusted sale prices for Sale 1 and 2?

	Subject	Sale 1	Sale 2
Date of sale		6 months ago	15 months ago
Age	10 years	12 years	9 years
Area	1,300 sq. ft.	1,500 sq. ft.	1,750 sq. ft.
Bedrooms	3	3	4
Baths	1	2	1 1/2
Sale price		$75,000	$80,000

After analyzing the market, the following adjustment are in order	
Time adjustment	5% per year
Age	$2,000 per year
Bedrooms	$1,750 per room
Baths	$1,800 for full bath; $600 for 1/2 bath
Area	$10 per square foot

Appraisal 2 – Answers

1. What is the square foot value and indicated value for the subject property?

	Subject	Sale 1	Sale 2	Sale 3
Sale price		$480,000	$570,000	$485,000
Market conditions adjustment		1.5% (6 x .0025)	0 (0 x .0025)	3% (12 x .0025)
Market adjusted sale price		$487,200	$570,000	$499,550
Area *(square feet)*	6,400	6,100	7,200	5,800
Sale price per square foot		$79.87	$79.17	$86.13
Heating and cooling	Yes	Equal	+10%	Equal
Quality	Average	+10%	Equal	-10%
Condition	Average	Equal	Equal	+ 5%
Security doors *(two)*	Yes	Equal	Equal	+5%
Fire protection	Yes	Equal	+ 5%	Equal
Location	Elm	+ 5%	Equal	Equal
Construction	Brick	Equal	Equal	+ 5%
Parking	Covered	+ 5%	+ 5%	+ 5%
Net adjustments		+20%	+20%	+10%
Adjusted sale price per sq. ft.		$95.84	$95.00	$94.74
Sq. ft. value for subject property?	$95.00 *(all other things being equal, the sale closest in time is the appropriate choice)*			
Indicated value for subject property?	6,400 (sq. ft. area) x $95.00 *(adjusted sale price per sq. ft.)* = $608,000			

2. Based on the given information, answer the following three questions.

	Subject	Sale 1	Sale 2
Date of sale		6 months ago	15 months ago
Age	10 years	12 years	9 years
Area	1,300 sq. ft.	1,500 sq. ft.	1,750 sq. ft.
Bedrooms	3	3	4
Baths	1	2	1.5
Sale price		$75,000	$80,000

After analyzing the market, the following adjustment are in order	
Time adjustment	5% per year
Age	$2,000 per year
Bedrooms	$1,750 per room
Baths	$1,800 for full bath; $600 for 1/2 bath
Area	$10 per square foot

A. What are the time adjustments for Sale 1 and 2?
- **Sale 1 = $1,875 (75,000 x .025 [time adjustment is 5% per year, so 6 months is 2.5%])**
- **Sale 2 = $5,000 (80,000 x .0625 [time adjustment is 5% per year, so 15 months is 6.25%])**

B. What are the age adjustments for Sale 1 and 2?
- **Sale 1 = +$4,000 (12 years – 10 years = 2 x 2,000 = 4,000)**
- **Sale 2 = -$2,000 (9 years – 10 years = 1 x 2,000 = -2,000) the number is negative to reflect that sale 2 is newer than the subject sale and must be counted against the subject sale when considering the subjects value)**

C. What are the adjusted sale prices for Sale 1 and 2?
- **Sale 1 = $77,075**
    - » **+$1,875 (time)**
    - » **+$4,000 (age)**
    - » **-$2,000   (200 sq. ft. x $10 per ft.)**
    - » **-$1,800   (1 bath)**

- **Sale 2 = $76,150**
    - » **+$5,000 (time)**
    - » **-$2,000 (age)**
    - » **-$4,500   (450 sq. ft. x $10 per ft.)**
    - » **-$1,750 (1 room)**
    - » **-$600   (1/2 bath)**

IV. Assessor 2, 3

A. Income Approach Principles

1. **Income approach –** one of three traditional approaches to value which measures the present worth of the future benefits of a property by the capitalization of its net income stream over its remaining economic life. The approach involves making an estimate of the potential net income of the property may be expected to yield, and capitalizing that income into an indication of value.

2. **Income statement –** proper and improper expenses to apply under this approach

3. **Potential gross income –** 100 percent occupied at market (economic) rent

4. **Effective gross income –** the estimated gross income of a property (including service income) less an appropriate allowance for vacancies and collection losses

5. **Net operating income –** determining requires

6. **Principles of conformity, balance and anticipation:**
   - **Conformity –** the maximum market value is reached when there is reasonable similarity between the improvements in a neighborhood, and when the residents have similar ages, incomes, education, attitudes, etc. The value of a property depends, to some extent, on its relation to its surroundings. Conformity in use is usually a highly desirable adjunct of real property, since it creates and/or maintains maximum value.
   - **Balance –** for individual property, the highest market value will result when the size and type of improvements are proportional to each other as well as to the land. For a neighborhood, maximum market value is reached when uses of land are perfectly complementary. Value is created and maintained in proportion to the equilibrium attained in the amount and location of essential uses of real estate.
   - **Anticipation –** value is created by the expected future benefits to be derived from the property

7. **Capitalization rate –** a composite rate used for converting property income into property value. A capitalization rate will increase when the income property becomes less desirable.

8. **Straight line capitalization –** assumes an income stream that increases or decreases by a fixed amount

B. Income Approach – Sample Questions

1. **True or False? – The income approach derives an expression of present worth by converting future benefits into a market value.**

2. **Calculate Potential Gross Income using the following facts:**
   A retail store that has 2,500 square feet rents for $15 per square foot per year (market rent).

3. **Calculate Effective Gross Income using the following facts:**
   An apartment complex has a potential gross income of $62,500. The vacancy and collection loss is calculated at 8 percent. Miscellaneous income from coin operated laundry machines on site is $3,750.

4. **Identify whether the listed expense is properly or improperly included on an income and expense statement under the income approach.**
   - Income taxes
   - Management
   - Utilities
   - Mortgage payment
   - Advertising

5. **Calculate Net Operating Income using the following facts:**
   An apartment complex has a potential gross income of $62,500. The vacancy and collection loss is calculated at 8 percent. Miscellaneous income from coin operated laundry machines on site is $3,750. Expenses include utilities ($4000), mortgage costs ($25,000), and management costs ($2,000).

6. **If using expected future benefits to create value, one is relying upon what principle of value?**

7. **The relation of property value to the properties surroundings is the underpinning of what principle of value?**

8. **What principle stands for the proposition that equilibrium is a central component to maximizing market value?**

Income Approach – Answers

1. True or False: The income approach derives an expression of present worth by converting future benefits into a market value   **True**

2. Calculate Potential Gross Income using the following facts:
   A retail store that has 2,500 square feet rents for $15 per square foot per year (market rent).
   2,500 square feet x $15 per square foot=$37,500 potential gross income

3. Calculate Effective Gross Income using the following facts:
   An apartment complex has a potential gross income of $62,500. The vacancy and collection loss is calculated at 8 percent. Miscellaneous income from coin operated laundry machines on site is $3,750.

   PGI = $62,500
   Less vacancy and collection loss (8%): $5,000 (62,500 x .08)
   $57,500
   Plus miscellaneous income: $3,750
   EGI = $61,250

4. Identify whether the listed expense is properly or improperly included on an income and expense statement under the income approach
   - Income taxes **(no)**
   - Management **(yes)**
   - Utilities **(yes)**
   - Mortgage payment **(no)**
   - Advertising **(yes)**

5. Calculate Net Operating Income using the following facts:
   An apartment complex has a potential gross income of $62,500. The vacancy and collection loss is calculated at 8 percent. Miscellaneous income from coin operated laundry machines on site is $3,750. Expenses include utilities ($4000), mortgage costs ($25,000), and management costs ($2,000).

   PGI = $62,500
   Less vacancy and collection loss (8%): $5,000 (62,500 x .08)
   $57,500
   Plus miscellaneous income: $3,750
   EGI = $61,250
   Less operating expenses: $6,000
   NOI = $55,250

6. If using expected future benefits to create value, one is relying upon what principle of value?
   Anticipation

7. The relation of property value to the properties surroundings is the underpinning of what principle of value?   **Conformity**

8. What principle stands for the proposition that equilibrium is a central component to maximizing market value?   **Balance**

C. Income Approach (Mortgage Constants) – Sample Questions

In the mortgage-equity capitalization method, the impact of mortgage terms and equity requirements are considered in terms of calculating value for income-producing property. The mortgage constant represents the annual total debt service, including payments of interest and amortization, expressed as a percentage of the amount of the loan.

Annual Payment Total/Total Mortgage Amount = Mortgage Constant

Example
What is the mortgage constant for a $300,000 mortgage with a $2,375 monthly payment?
Annual Payment = $2,375 x 12 = $28,500
$28,500 / $300,000 = .095
Mortgage constant = 9.5%

Sample Questions
1. What is the mortgage constant for a $450,000 mortgage with a $4,125 monthly payment?

2. What is the mortgage constant for a $276,000 mortgage with a $1,840 monthly payment?

3. What is the mortgage constant for a $320,000 mortgage with a $3,200 monthly payment?

Income Approach (Mortgage Constants) – Answers

1. **What is the mortgage constant for a $450,000 mortgage with a $4,125 monthly payment?**   **11%**
   $4,125 x 12 = $49,500 $49,500/$450,000 = .11

2. **What is the mortgage constant for a $276,000 mortgage with a $1,840 monthly payment?**   **8%**
   $1,840 x 12 = $22,080 $22,080/$276,000 = .08

3. **What is the mortgage constant for a $320,000 mortgage with a $3,200 monthly payment?**   **12%**
   $3,200 x 12 = $38,400 $38,400/$320,000 = .12

D. Age-Life Method and Depreciation Terms – Sample Questions

Loss in value from all causes. May be further classified as physical – referring to the loss of value caused by physical deterioration; functional – referring to the loss of value caused by obsolescence inherent in the property itself; and economic – referring to the loss of value caused by factors extraneous to the property.

- **Effective age –** typical age of a structure equivalent to the one in question with respect to its utility and condition. Knowing the effective age of an old, rehabilitated structure or a building with substantial deferred maintenance is generally more informative than knowing its chronological age.
- **Economic life –** the life expectancy of a property during that it can be expected to be used profitably
- **Calculating depreciation age-life method –** effective age/economic life = depreciation
- **Physical depreciation –** impairment of structural condition evidenced by the wear and tear caused by physical use and the action of the elements
- **Functional obsolescence –** loss of value caused by obsolescence inherent in the property itself
- **Economic obsolescence –** loss of value caused by factors extraneous to the property

1. **Given the following information, determine the percentage of depreciation**
   A. Effective Age 18 years
   B. Economic Life 40 years

2. **Given the following information, determine the cost new of the structure**
   A. Effective Age 10 years
   B. Economic Life 40 years
   C. Depreciation $40,000

3. **Given the following information, determine the percentage of depreciation**
   A. Effective Age 20 years
   B. Economic Life 50 years

4. **What is the accrued depreciation using the age-life method?**
   A. Cost New $300,000
   B. Effective Age 10 years
   C. Economic Life 40 years

Age-Life Method and Depreciation Terms – Answers

1. **Given the following information, determine the percentage of depreciation**
   A. Effective Age 18 years
   B. Economic Life 40 years
   Answer: 45%
   18/40: 0.45

2. **Given the following information, determine the cost new of the structure**
   A. Effective Age 10 years
   B. Economic Life 40 years
   C. Depreciation $40,000
   Answer: $160,000
   10/40 = 0.25 $40,000/0.25 = $160,000

3. **Given the following information, determine the percentage of depreciation**
   A. Effective Age 20 years
   B. Economic Life 50 years
   Answer: 40%
   20/50 = 0.40

4. **What is the accrued depreciation using the age-life method?**
   A. Cost New $300,000
   B. Effective Age 10 years
   C. Economic Life 40 years
   Answer: $75,000
   10/40 = 0.25 $300,000 x 0.25 = $75,000

V. Assessor 3

A. County Assessment Principles

Review state law (sec. 70.99, Wis. Stats.), for information regarding county assessment. Relevant items include: assessor appointment, budget assistance, and compensation for attending BOR.

B. Statutory Requirements for First and Second Class Cities – Principles

First and second class cities
- **Boards of Assessors**
- **Boards of Review**

Source for review: WPAM Chapter 21

C. Cost Estimation and Depreciation Principles

1. **Cost approach to value –** one of the three traditional approaches to value by which an indication of the value of a property is arrived at by estimating the value of the land, the replacement or reproduction cost new of the improvement, and the amount of accrued depreciation to the improvement. The estimated land value is then added to the estimated depreciated value of the improvements to arrive at the estimated property value. Most applicable when valuing new or proposed construction when the land value is well supported (building new and represents proper improvement to land).

   The basic steps are:
   - Estimate the value of the site as if vacant and available to be put to its highest and best use
   - Estimate replacement cost new of the structure
   - Estimate accrued depreciation from all sources
   - Subtract the accrued depreciation estimate from the estimate of cost new to arrive at a present value for the improvements
   - Add the present value of the improvements to the estimated land value for a total property value

2. **Quantity survey: method of estimating cost –** involves a detailed itemized estimate of the quantities of various materials used, labor and equipment requirements, architect and engineering fees, contractor's overhead and profit, and other related costs. This method is primarily used by contractors and cost estimators for bidding and budgetary purposes and is much too laborious and costly to be effective in everyday appraisal work, especially in the mass appraisal field.

3. **Unit-in-place: method of estimating cost –** employed by establishing in-place cost estimates (including material, labor, overhead, and profit) for various structural components. The prices established for the specified components are related to their most common units of measurement such as cost per yard of excavation, cost per linear foot of footings, and cost per square foot of floor covering. The unit prices can then be multiplied by the respective quantities of each as they are found in the composition of the subject building to derive the whole dollar component cost, the sum of which is equal to the estimated cost of the entire building, providing of course, that due consideration is given to all other indirect costs which may be applicable.

4. **Square foot/model: method of estimating cost –** a further extension, in that unit-in-place costs are used to develop base unit square foot or cubic foot costs for total specified representative structures in place, which may then serve as "models" to derive the base unit cost of comparable structures to be appraised. The base unit cost of the model most representative of the subject building is applied to the subject building and appropriate tables of additions and deductions are used to adjust the base cost of the subject to account for any significant variations between it and the model.

5. **Depreciation –** loss in value from all causes; may be further classified as physical, referring to the loss of value caused by physical deterioration; functional, referring to the loss of value caused by obsolescence inherent in the property itself; and economic, referring to the loss of value caused by factors extraneous to the property. Accrued depreciation refers to the actual depreciation existing in a particular property as of a specified date. Normal depreciation refers to that amount of accrued depreciation one would normally expect to find in buildings of certain construction, design, quality and age.

6. **Gross rent multiplier (GRM) –** The GRM is used to provide a direct estimate of value based on the relationship between gross income and sale prices of similar properties. This method can also be considered a type of income approach. The GRM is the sale price divided by the annual or monthly gross income. For example, if the sale price of a property is $400,000 and the gross annual income is $50,000 the annual GRM is: Sale Price Annual Income = $400,000 / $50,000 = 8 (GRM)

D. Cost Estimation and Depreciation – Sample Questions

1. **If evaluating quality of workmanship, materials, and design is central to the approach, what approach to value is being used?**

2. **Which method of estimating cost contains the most amount of detail and is most accurate?**

3. **Which method of estimating cost combines direct costs into a single unit figure to multiply by the area of the building being priced – resulting in a total cost estimate for that portion?**

4. **Which method of estimating costs are summed and divided by an appropriate unit to derive a cost per unit?**

5. **Calculate the cost per square foot given the following facts:**

   A one-story residence with six rooms and 1,080 square feet of gross living area located on an 18,000 square-foot site is being appraised. There are three recent sales of similar properties in the neighborhood. All the properties were new at the time of sale.
   - **Property 1** – was sold recently for $175,200. It has six rooms and 1,100 square feet and is located on a 20,000 square-foot site
   - **Property 2** – was sold recently for $223,500. It contains seven rooms and 1,400 square feet and is located on a 30,000 square-foot site
   - **Property 3** – was sold recently for $145,500. It contains five rooms and 900 square feet and is located on a 16,000 square-foot site
   - Land sales in the area are well documented at $2.00 per square foot

What indicated cost new is derived by using the comparative unit or square foot method?

	Sale 1	Sale 2	Sale 3
Sale price	$ 175,200	$ 223,500	$ 145,500
Less lot value	- 40,000	- 60,000	- 32,000
Cost new	135,200	163,500	113,500
Cost of new improvements	135,200	163,500	113,500
Gross living area (sq ft)	÷ 1,100	÷ 1,400	÷ 900
Unit cost			

6. The difference between cost new of an improvement and its market value as of the date of appraisal or a reduction in the value of an asset with the passage of time, due in particular to wear and tear, is known as what?

7. Types of depreciation include?

8. What mechanism to value rental property reflects the relationship between gross rental and the selling price of a property?

9. Calculate the monthly gross rent multiplier with the given facts. Assume a sale price of $280,000 for a single-family residence that rents for $2,500 per month.

Cost Estimation and Depreciation – Answers

1. If evaluating quality of workmanship, materials, and design is central to the approach, what approach to value is being used?   **Cost**

2. Which method of estimating cost contains the most amount of detail and is most accurate? **Quantity Survey**

3. Which method of estimating cost combines direct costs into a single unit figure to multiply by the area of the building being priced – resulting in a total cost estimate for that portion?   **Unit-in-Place**

4. Which method of estimating costs are summed and divided by an appropriate unit to derive a cost per unit?   **Square foot or comparative unit method**

5. Calculate the cost per square foot given the following facts:

   A one-story residence with six rooms and 1,080 square feet of gross living area located on an 18,000 square-foot site is being appraised. There are three recent sales of similar properties in the neighborhood. All the properties were new at the time of sale.

   - **Property 1** – was sold recently for $175,200. It has six rooms and 1,100 square feet and is located on a 20,000 square-foot site

   - **Property 2** – was sold recently for $223,500. It contains seven rooms and 1,400 square feet and is located on a 30,000 square-foot site

   - **Property 3** – was sold recently for $145, 500. It contains five rooms and 900 square feet and is located on a 16,000 square-foot site.

   - Land sales in the area are well documented at $2.00 per square foot

   What indicated cost new is derived by using the comparative unit or square foot method?

	Sale 1	Sale 2	Sale 3
Sale price	$ 175,200	$ 223,500	$ 145,500
Less lot value	- 40,000	- 60,000	- 32,000
Cost new	135,200	163,500	113,500
Cost of new improvements	135,200	163,500	113,500
Gross living area (sq ft)	÷ 1,100	÷ 1,400	÷ 900
Unit cost			

   Because the subject, with 1,080 square feet, is only 20 square feet smaller than Sale 1, the cost new of the subject property could be estimated at $123.00 per square foot.

6. The difference between cost new of an improvement and its market value as of the date of appraisal or a reduction in the value of an asset with the passage of time, due in particular to wear and tear, is known as what?   **Depreciation**

7. Types of depreciation include: **Physical, functional obsolescence, and external or economic**

8. What mechanism to value rental property reflects the relationship between gross rental and the selling price of a property?   **Gross Rent Multiplier**

9. Calculate the monthly gross rent multiplier with the given facts. Assume a sale price of $280,000 for a single-family residence that rents for $2,500 per month.   **GRM = 112 (280,000 / 2,500)**

E. Management – Principles

1. **Strategic plan –** is a long range plan usually developed by top and middle management and should incorporate the following (with a range of approximately five years):
    * Process to determine where the organization is going
    * Formal consideration of an organization's future course
    * Desired outcomes with specific steps
    * Provide blueprints against which staff can measure day to day activities

2. **Operational plan –** is a short range plan generally developed by middle or first line management and should contain detailed information about objectives, serve as a basis for the requested budget, and specify desired results. These are useful for special projects.

3. **Organizational plan –** includes personnel and functional structure of the organization with optimal staff and statements of duties/responsibilities. The principles of organization must be applied with judgment to specific operations and begin with defining the job to be done.

4. **Good public relations –** are considered a method of carrying out job responsibilities as the actions affect the community. Public relations are the methods and means by which a person or an organization seeks to promote a favorable relationship with the public.

5. **Management –** is the core function of any organization. Management includes the process of organizing and employing resources to accomplish predetermined objectives.

6. **Budget –** is the critical link between planning and doing. It is a statement of estimated revenues and expenditures for a definite period of time.

7. **Line authority**
    * Hierarchical form of authority
    * Manager to direct the work of an employee
    * It is the employer-employee authority relationship that extends from top to bottom
    * Line manager directs the work of employees and makes certain decisions without consulting anyone
    * It is a small level enterprise
    * Top management has complete control
    * A line supervisor should maintain relationships with staff by keeping them informed of developments in their respective areas

8. **Written job description** – is beneficial for strategic planning, employee training, and evaluations. An employee should understand the significance of their work in relation to the aims of their office.

9. **Employee evaluations** – should include a measure of efficiency that includes the effectiveness and control over their work. Evaluations are a necessary and important function in the administration of an office. In an evaluation, an administrator should consider the evaluations by supervisors, their own observations, work progress reports, and other relevant data available.

10. **Process control** – should include the means that the supervisor has to determine the status of their work and the effectiveness of their planning

11. **Primary goal of a supervisor** – is to train staff assigned to them in the best methods of completing their work

12. **Delegation** – to entrust one's authority to a competent subordinate. It is the process of assigning various degrees of decision-making authority. Delegation has the benefit of allowing the administrator time to plan and create policy. The benefit to the subordinate is increased responsibility. The most appropriately delegated factor to delegate is one of function.

F. Management – Sample Questions

1. **Select which of the following is a short range plan that is useful for special projects**
    A. Operational plan
    B. Strategic plan
    C. Organizational plan
    D. Budget

2. **Select which of the following is a long range plan that may incorporate the process to determine where the organization is going with an approximate range of five years**
    A. Operational plan
    B. Strategic plan
    C. Organizational plan
    D. Budget

3. **Select which of the following includes personnel and functional structure of the organization with optimal staff and statements of duties/responsibilities**
    A. Operational plan
    B. Strategic plan
    C. Organizational plan
    D. Budget

4. **Select which of the following is a benefit for written job descriptions**
    A. Strategic planning
    B. Employee training
    C. Evaluations
    D. All of the above

5. **What should an administrator consider during employee evaluations?**
   A. Observations
   B. Work progress reports
   C. Evaluations by direct supervisors
   D. All of the above

6. **A process control is incomplete without which of the following?**
   A. Formal business formatting
   B. The names of everyone involved
   C. The means by which the supervisor has to determine the status of their work and effectiveness of their planning
   D. None of the above

7. **A statement of estimated revenues and expenditures for a definite period of time describes which of the following?**
   A. Organizational plan
   B. Good public relations
   C. An effective management tool
   D. A budget

8. **A good public relations program includes which of the following?**
   A. The core function of any organization
   B. The methods and means by which a person or an organization can promote a favorable relationship with the public
   C. Measuring the efficiency and effectiveness of an employee
   D. All of the above

9. **Line authority includes which of the following?**
   A. Hierarchical form of authority
   B. Manager to direct the work of an employee
   C. It is the employer-employee authority relationship that extends from top to bottom
   D. All of the above

10. **Delegation benefits the administrator by allowing more time for planning and policy. Whereas, the employee benefits from increased responsibility. What factor is the most appropriate to delegate?**
    A. Organization
    B. Budgeting
    C. Function
    D. Process control

Management – Answers

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   A. Operational plan
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