# Income Approach to Value
# Problems and Answers

2026 Level I Tutorials

# Development of Allowable Expenses

Given below is the statement of expenses for a business as prepared by the owner's accountant. They are actual bank withdrawals and are assumed to be correct. In your analysis of the statement for appraisal purposes, you have decided that some items can be used as stated, others need to be eliminated, and some need to be pro-rated. Indicate with an "X" which items you would use as stated, pro-rated (over more than one year), or would eliminate from your reconstructed operating statement.

| | | As Stated | | Pro-Rate | | Eliminate |
|---|---|---|---|---|---|---|
| A. | Management Fees | | | | | |
| B. | Advertising | | | | | |
| C. | Maintenance Personnel Salaries | | | | | |
| D. | Maintenance Personnel Benefits | | | | | |
| E. | Debt Service on Mortgage | | | | | |
| F. | Water and Sewage Fees | | | | | |
| G. | Electricity | | | | | |
| H. | Gas for Heating | | | | | |
| I. | New Roof | | | | | |
| J. | Miscellaneous Repairs | | | | | |
| K. | Supplies | | | | | |
| L. | Casualty Insurance--3 year policy | | | | | |
| M. | Liability Insurance | | | | | |
| N. | Snow Removal | | | | | |
| O. | Income Tax | | | | | |
| P. | Donation, Christmas Gift Expense | | | | | |
| Q. | Real Estate Taxes | | | | | |

# Development of Allowable Expenses

Indicate with an "X" which items you would use as stated, pro-rated (over more than one year), or would eliminate from your reconstructed operating statement.

| | | As Stated | | Pro-Rate | | Eliminate |
|---|---|---|---|---|---|---|
| A. | Management Fees | X | | | | |
| B. | Advertising | X | | | | |
| C. | Maintenance Personnel Salaries | X | | | | |
| D. | Maintenance Personnel Benefits | X | | | | |
| E. | Debt Service on Mortgage | | | | | X |
| F. | Water and Sewage Fees | X | | | | |
| G. | Electricity | X | | | | |
| H. | Gas for Heating | X | | | | |
| I. | New Roof | | | X | | |
| J. | Miscellaneous Repairs | X | | | | |
| K. | Supplies | X | | | | |
| L. | Casualty Insurance--3 year policy | | | X | | |
| M. | Liability Insurance | X | | | | |
| N. | Snow Removal | X | | | | |
| O. | Income Tax | | | | | X |
| P. | Donation, Christmas Gift Expense | | | | | X |
| Q. | Real Estate Taxes | | | | | X |

# Income Approach

- At this time, please go back to the Income Approach PowerPoint and resume on slide #95.

# Income Approach
## Problem # 1
## Determination of Net Operating Income

You are trying to determine the value of a small retail center containing 4,500 square feet of Net Leasable Area. There are three leasable spaces in the building, and at present two of the spaces are leased. You have determined the following information:

1.) Market rent for this type of space is $22 per square foot.
2.) The owner has $3,000 per year in miscellaneous income.
3.) The market vacancy rate is 4% and the market collection loss rate is 1%.
4.) Operating Expenses from the reconstructed operating statement are $30,500.
5.) The Reserve for Replacements is $5,000.

Determine the Net Operating Income (NOI) for the subject property.

| | |
|---|---|
| Potential Gross Income (PGI) | |
| Vacancy and Collection Loss | |
| Miscellaneous Income | |
| Effective Gross Income (EGI) | |
| Operating Expenses | |
| Reserves for Replacements | |
| Net Operating Income (NOI) | |

# Income Approach
# Problem # 1 Answer
# Determination of Net Operating Income

| | |
|---|---|
| Potential Gross Income | $99,000 |
| Less: Vacancy and Collection Loss | ($4,950) |
| Add:  Miscellaneous Income | $3,000 |
| Effective Gross Income | $97,050 |
| Less: Operating Expenses | ($30,500) |
| Less: Reserve For Replacements | ($5,000) |
| Net Operating Income | $61,550 |

| | |
|---|---|
| Net leasable area of 4,500 Square feet times $22/Square Foot | $99,000 |
| Vacancy loss rate of 4% plus Collection loss rate of 1% times PGI | ($4,950) |
| Add miscellaneous income (given) | $3,000 |
| Effective Gross Income (EGI) | $97,050 |
| Less expenses (given) | ($30,500) |
| Less reserves for replacements (given) | ($5,000) |
| Net Operating Income (NOI) | $61,550 |

# Income Approach

- At this time, please go back to the Income Approach PowerPoint and resume on slide #99.

## Problem # 2 (A)
## Gross Rent Multiplier Problem

The subject property is a single family dwelling which is rented for $475 per month.
The market rent is also $475 per month. Develop a GRM from the following data and use it to calculate a possible indication of value.

Sales

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Sale Price | $60,000 | $72,000 | $65,000 | $62,000 | $68,000 |
| Monthly Rent (EGI) | $425 | $520 | $460 | $450 | $490 |
| GRM | | | | | |

# Income Approach
# Problem # 2 (A) Answer
# Gross Rent Multiplier Problem

The subject property is a single family dwelling which is rented for $475 per month.
The market rent is also $475 per month. Develop a GRM from the following data and use it to calculate a possible indication of value.

Sales

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Sale Price | $60,000 | $72,000 | $65,000 | $62,000 | $68,000 |
| Monthly Rent (EGI) | $425 | $520 | $460 | $450 | $490 |
| GRM | 141.2 | 138.5 | 141.3 | 137.8 | 138.8 |

GRM = Sales Price divided by the Monthly Rent (EGI)
Median is 138.8
Possible indication of value: Market rent of $475 times 138.8 = $65,930 rounded to $65,900

# Income Approach
# Problem # 2 (B)
# Gross Income Multiplier Problem

The subject property produces Gross Annual Effective Gross Income of $72,000. Analysis of rents and sales of comparable properties rendered the following. Based upon this information calculate a Gross Income Multiplier (GIM) and then calculate indication of value for subject property.

| Sale | Sale Price | EGI | Gross Income Multiplier |
|---|---|---|---|
| 1 | $675,000 | $75,000 | |
| 2 | $600,000 | $68,000 | |
| 3 | $720,000 | $85,700 | |
| 4 | $750,000 | $87,500 | |
| 5 | $650,000 | $73,000 | |

| Gross Income Multiplier Range |
|---|
| |
| |
| |
| |
| |

<u>Estimated value of subject property</u>:

| | |
|---|---|
| Value using Low range (Low range is the lowest of the GIMs) | |
| Value using High range (High range is the highest of the GIMs) | |
| Value using Median | |

# Income Approach
# Problem # 2 (B) Answer
# Gross Income Multiplier Problem

The subject property produces Gross Annual Effective Gross Income of $72,000. Analysis of rents and sales of comparable properties rendered the following. Based upon this information calculate a Gross Income Multiplier (GIM) and then calculate indication of value for subject property.

| Sale | Sale Price | EGI | Gross Income Multiplier |
|---|---|---|---|
| 1 | $675,000 | $75,000 | 9.0 |
| 2 | $600,000 | $68,000 | 8.8 |
| 3 | $720,000 | $85,700 | 8.4 |
| 4 | $750,000 | $87,500 | 8.6 |
| 5 | $650,000 | $73,000 | 8.9 |

| Gross Income Multiplier Range |
|---|
| 8.4 |
| 8.6 |
| 8.8 |
| 8.9 |
| 9.0 |

GIM = Sale Price divided by the EGI

Possible indicated range of value:

| | |
|---|---|
| Subject property EGI of $72,000 times low range = 8.4 | $604,800 |
| Subject property EGI of $72,000 times high range = 9.0 | $648,000 |
| Subject property EGI of $72,000 times median range = 8.8 | $633,600 |

## Problem # 3(a)
## Belle River Office Building
## Determine PGI, EGI, and NOI

You are appraising an office building in the Belle River complex. The building is three stories high and contains 20,000 square feet on each floor. The net leasable area on each floor is 17,500 square feet. There are three offices on each floor, but the square footage per office varies with the client. The leases have been entered into at various times over the past four years. The current rent roll is as follows:

| First Floor | Area | Total Rent Paid |
|---|---|---|
| Thomas and Associates | 3,750 | $ 69,375 |
| Katz, Katz, and Doggz | 8,250 | $ 123,750 |
| Kelley Engineering | 5,500 | $ 88,000 |
| Second Floor | | |
| Second Job Agency | 4,000 | $ 72,000 |
| Paperman Publishing | 9,200 | $ 142,600 |
| Vacant | 4,300 | $ - |
| Third Floor | | |
| Silverman and Goldman | 8,000 | $ 128,000 |
| Leland Entertainment | 3,000 | $ 51,000 |
| Media Heaven Ad Agency | 6,500 | $ 110,500 |

In researching the market, you have found that recently negotiated office rent in the same type location is running $20.10 per square foot.

What is the Potential Gross Income for your subject property?

The market collection loss for office space in this area is 1.2%. Using this rate develop a vacancy and collection loss rate for the subject building.

Using the above information, what is the Effective Gross Income of the subject?

## Problem # 3(a) Answers
## Belle River Office Building - Determine PGI, EGI, and NOI

PGI

17,500 sq. ft. NLA on each floor; complex has 3 floors.
17,500 x 3 =52,500 sq ft.

Market Rent is $20.10 per sq. ft.
$20.10 x 52,500 =$1,055,250

Vacancy Rate

There is one vacant office of 4,300 sq. ft.
4,300 ÷ 52,500 =8.2%

Vacancy and Collection Loss Rate (V&C)

Vacancy Rate is 8.2% and the Collection Loss Rate is 1.2%.
8.2% + 1.2% =9.4%

EGI

PGI = $1,055,250 and the V&C = 9.4%
No Miscellaneous Income is listed.

PGI $1,055,250
- V&C -$99,194
+ Misc. Inc. $0
= EGI $956,056

## Income Approach Problem # 3(b)
## Belle River Office Building - Determine PGI, EGI, and NOI

The property management company of Bell River Complex (from slide 5) has furnished you with this operating statement. Upon further analysis, you have determined that the operating statement is incorrect for ad valorem purposes. Reconstruct the operating statement using information from slide 6 (PGI, V&C, and EGI), remove any improper expenses listed below, and find the correct NOI for the property.

Belle River Office Building
Operating Statement as filed

| | | |
|---|---|---|
| Potential Gross Income | $ 785,225.00 | |
| Less: Vacancy and Collection Loss 8.2%) | $ (64,388.00) | |
| Add: Miscellaneous Income | $0.00 | |
| Effective Gross Income | | $ 720,837.00 |
| | | |
| Less operating expenses: | | |
| Management Fees (10% of EGI) | $ (72,084.00) | |
| Property Taxes | $ (28,457.00) | |
| Lawn Care | $ (2,300.00) | |
| Supplies/Maintenance | $ (7,248.00) | |
| Maintenance Salaries/Benefits | $ (28,340.00) | |
| Common Lighting | $ (1,345.00) | |
| Water and Sewer | $ (6,573.00) | |
| Electricity | $ (11,965.00) | |
| Gas | $ (15,996.00) | |
| Liability Insurance | $ (7,100.00) | |
| Debt Service | $(173,900.00) | |
| Snow Removal | $ (1,100.00) | |
| Income taxes | $ (61,230.00) | |
| Donation to City Festival | $ (500.00) | |
| Christmas party for tenants | $ (1,345.00) | |
| Casualty Insurance (3 year policy) | $ (845.00) | |
| Membership in trade association | $ (1,500.00) | |
| Flower fund | $ (734.00) | |
| Total operating expenses | | $(422,562.00) |
| | | |
| Less Reserve for Replacements | | $ (22,500.00) |
| | | |
| Net Operating Income | | $ 275,775.00 |

## Income Approach Problem # 3(b) Answer

## Belle River Office Building - Determine PGI, EGI, and NOI

| | | Area | Market Rent | PGI | |
|---|---|---|---|---|---|
| First Floor | | | | | |
| Thomas and Associates | | 3,750 | $20.10 | $75,375 | |
| Katz, Katz and Doggz | 17,500 | 8,250 | $20.10 | $165,825 | |
| Kelley Engineering | | 5,500 | $20.10 | $110,550 | |
| Second Floor | | | | | |
| Second Job Agency | | 4,000 | $20.10 | $80,400 | |
| Paperman Publishing | 17,500 | 9,200 | $20.10 | $184,920 | |
| Vacant | | 4,300 | $20.10 | $86,430 | |
| Third Floor | | | | | |
| Silverman & Goldman | | 8,000 | $20.10 | $160,800 | |
| Leland Entertainment | 17,500 | 3,000 | $20.10 | $60,300 | |
| Media Heaven Advertising Agency | | 6,500 | $20.10 | $130,650 | |
| | Total Net Leasable Area = | 52,500 | | $1,055,250 | PGI |
| POTENTIAL GROSS INCOME | | | | $1,055,250 | PGI |
| LESS: VACANCY LOSS AND COLLECTION LOSS | | | | ($99,194) | |
| ADD: MISCELLANEOUS INCOME | | | | $0 | |
| EFFECTIVE GROSS INCOME | | | | $956,056 | EGI |
| LESS: OPERATING EXPENSES | | | | | |
| MANAGEMENT FEES (10% OF EGI) | | | | ($95,606) | |
| LAWN CARE | | | | ($2,300) | |
| SUPPLIES/MAINTENANCE | | | | ($7,248) | |
| MAINTENANCE SALARIES/BENEFITS | | | | ($28,340) | |
| COMMON LIGHTING | | | | ($1,345) | |
| WATER & SEWER | | | | ($6,573) | |
| ELECTRICITY | | | | ($11,965) | |
| GAS | | | | ($15,996) | |
| LIABILITY INSURANCE | | | | ($7,100) | |
| SNOW REMOVAL | | | | ($1,100) | |
| CASUALTY INSURANCE 3 YR POLICY--PRO RATE 845/3 | | | | ($282) | |
| MEMBERSHIP IN TRADE ASSOCIATION | | | | ($1,500) | |
| RESERVE FOR REPLACEMENTS | | | | ($22,500) | |
| NET OPERATING INCOME | | | | $754,201 | NOI |

| NLA Vacancy Rate | | |
|---|---|---|
| 4300/52500 | | 8.2% |
| Collection Rate Loss | + | 1.2% |
| V & C Rate Loss = | | 9.4% |

| PGI | | $1,055,250 |
|---|---|---|
| VAC & COLL LOSS | x | 9.4% |
| V&C $ Amount = | | $99,194.00 |

# Income Approach
## Practice Problem # 1
Developing NOI and Cap Rates

| | |
|---|---|
| Potential Gross Income | $150,000 |
| Vacancy and Collection Loss | 10% |
| Operating Expense | $25,000 |
| Christmas Gift | $2,500 |
| Property Value | $800,000 |
| Loan to value ratio | 0.4 |

The above is given to you, develop the NOI and the Overall Capitalization Rate.

Net operating Income _____

Overall Cap Rate _____

# Income Approach
## Practice Problem # 1 Answer
Developing NOI and Cap Rates

| | |
|---|---|
| PGI | $150,000 |
| V & C Loss ($150,000*10%) | -$15,000 |
| Misc Inc | $0 |
| Effective Gross Income | $135,000 |
| Operating Expense (Given) | -$25,000 |
| Net operating Income | $110,000 |

| | |
|---|---|
| Net operating Income | $110,000 |
| Overall Cap Rate (Income/Value=Rate) | 13.8% |

# Income Approach
## Practice Problem # 2
## Developing PGI, EGI, and NOI and Value of Subject

40000 square feet
Of this, 8000 square feet is common area
Market Rent  $20/square foot of net rentable area
Vacancy and Collection loss 6%
Operating Exp and Reserve for Replacement  18%
CAPITALIZATION RATE IS 10%

THE ABOVE IS GIVEN PER PROBLEM---DEVELOP PGI, EGI, & NOI AND THE VALUE OF THIS SUBJECT PROPERTY

Potential Gross Income _____
Vacancy and Collection Loss _____
Misc Income _____
Effective Gross Income _____
Operating Expenses & Reserves for Replacements _____
Net Operating Income _____

WHAT IS THE VALUE OF THIS PROPERTY _____

# Income Approach
## Practice Problem # 2 Answer
## Developing PGI, EGI, and NOI and Value of Subject

| | | | | | | |
|---|---|---|---|---|---|---|
| POTENTIAL GROSS INCOME | 32,000 | (NLA) | x | $20 (Market Rent) | = | $640,000 **PGI** |
| VACANCY & COLLECTION LOSS | $640,000 | (PGI) | x | 6% (V&C Loss) | = | -$38,400 |
| MISC. INCOME | $0 | | | | | $0 |
| EFFECTIVE GROSS INCOME | | | | | | $601,600 **EGI** |
| OPERATING EXP AND RESERVE FOR REPLACEMENT | $601,600 | (EGI) | x | 18% (Exp. & R.R.) | = | -$108,288 |
| NET OPERATING INCOME | | | | | | $493,312 **NOI** |

IF THE CAPITALIZATION RATE IS 10%

WHAT IS THE VALUE OF THIS PROPERTY?

| | | |
|---|---|---|
| THE NET OPERATING INCOME FROM ABOVE IS | $493,310 | |
| CAPITALIZATION RATE IS | 10% | |
| ESTIMATED VALUE OF PROPERTY | $4,933,100 | I ÷ R = V |

# Income Approach
# Practice Problem # 3
# Developing an Expense Ratio

Using the below information, calculate an expense ratio for each of the four properties.

| SC | EGI | EXPENSES | RESERVES | | |
|---|---|---|---|---|---|
| Riverton | $469,775 | $135,330 | $15,000 | | |
| Eagle Ridge | $392,440 | $117,500 | $12,000 | | |
| Chatham | $518,760 | $148,000 | $18,000 | | |
| Hyde Park | $318,780 | $88,020 | $10,800 | | |

What is the Median expense ratio?

# Income Approach
# Practice Problem # 3 Answer
# Developing an Expense Ratio

Given the above information develop an expense ratio to use on our subject property.

| SC | EGI | EXPENSES | RESERVES | Total Expense | Exp Ratio |
|---|---|---|---|---|---|
| Rieverton | $469,775 | $135,330 | $15,000 | $150,330 | 32.0% |
| Eagle Ridge | $392,440 | $117,500 | $12,000 | $129,500 | 33.0% |
| Chatham | $518,760 | $148,000 | $18,000 | $166,000 | 32.0% |
| Hyde Park | $318,780 | $88,020 | $10,800 | $98,820 | 31.0% |

**The Median Expense Ratio is** **32.0%**

# Income Approach
# Practice Problem # 4 (A)
# Gross Rent Multiplier Problem VIF Formula

SALES

| | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| Sale Price | $45,000 | $56,000 | $48,000 | $53,500 | $58,000 |
| Monthly Rent | $425 | $520 | $450 | $490 | $525 |
| GRM | | | | | |

MONTHLY EGI OF SUBJECT PROPERTY $475

MEDIAN

USING THE MEDIAN GRM PROVIDE AN INDICATION OF VALUE TO THE NEAREST $100.

# Income Approach
## Practice Problem # 4 (A) Answer
## Gross Rent Multiplier Problem VIF Formula

| | SALES | | | | | GRM Rank |
|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 105.9 |
| Sale Price | $45,000 | $56,000 | $48,000 | $53,500 | $58,000 | 106.7 |
| Monthly Rent | $425 | $520 | $450 | $490 | $525 | 107.7 |
| GRM | 105.9 | 107.7 | 106.7 | 109.2 | 110.5 | 109.2 |
| | | | | | | 110.5 |

MONTHLY EGI OF SUBJECT PROPERTY $475

MEDIAN 107.7

USING THE MEDIAN GRM PROVIDE AN INDICATION OF VALUE TO THE NEAREST $100.

Indication of value $475 Times 107.7 $51,200

(ROUND TO THE NEAREST $100)

# Income Approach
# Practice Problem # 4 (B)
# Gross Income Multiplier Problem

| Sale | Sale Price | Effective Gross Income | Gross Income Multiplier |
|---|---|---|---|
| A | $650,000 | $75,000 | |
| B | $590,000 | $68,000 | |
| C | $695,000 | $85,700 | |
| D | $750,000 | $87,500 | |
| E | $620,000 | $73,000 | |

Ranges from _____ to _____

| GIVEN YEARLY EGI | RANGE | VALUES |
|---|---|---|
| $72,000 | | |
| $72,000 | | |

Median

PROVIDE THE HIGH AND LOW RANGE VALUES BASED ON THE GIM.

# Income Approach
## Practice Problem # 4 (B) Answer
## Gross Income Multiplier Problem

| Sale | Sale Price | Effective Gross Income | Gross Income Multiplier |
|---|---|---|---|
| A | $650,000 | $75,000 | 8.7 |
| B | $590,000 | $68,000 | 8.7 |
| C | $695,000 | $85,700 | 8.1 |
| D | $750,000 | $87,500 | 8.6 |
| E | $620,000 | $73,000 | 8.5 |

Ranges from 8.1 to 8.7

| | | | |
|---|---|---|---|
| $72,000 | LOW | 8.1 | $583,200 |
| $72,000 | HIGH | 8.7 | $626,400 |
| | | | |
| Median | | 8.6 | $619,200 |

ROUNDED TO NEAREST $100

# Level I

- This concludes the income approach problems and answers packet and is a reminder that should you have questions you can email these questions to the Department.

- Please send emails to Level1@dlgf.in.gov