

Real Estate & REIT Modeling

– Quiz Questions

Module 2 – Office Development & Sale

1. Please consider the screenshot below, which shows the key metrics for a new office development:

Lot, Floor, and Building Assumptions - Gekko Offices			
(\$ in US Dollars as Stated)			
Lot Square Footage:	13,000 sq. ft.	Maximum Allowable Lot Coverage:	75.0%
Maximum Allowable FAR (Floor Area Ratio):	15.0	Maximum Ground Floor Footprint:	9,750 sq. ft.
Maximum Square Footage for Building:	195,000 sq. ft.	Available Floor Space (Assumes Separate Floors):	90,000 sq. ft.
Building Height Limit:	350 ft.	Max. # of Floors (Assumes Separate Floors):	10
Average Floor Height:	15 ft.	Available Floor Space (Assumes Separate Floors):	7,200,000 sq. ft.
Number of Floors (Including Partial):	13	Max. # of Floors (Assumes Separate Floors):	90,000
Actual Building Height:	195 ft.	Max. # of Floors (Assumes Separate Floors):	1,250,000 sq. ft.

Based on these metrics, calculate the **BUILDING HEIGHT** and the **NUMBER OF FLOORS** the building will have:

- Number of Floors = 15; Actual Building Height = 200 ft.
- Number of Floors = 17; Actual Building Height = 275 ft.
- Number of Floors = 20; Actual Building Height = 300 ft.
- Number of Floors = 23; Actual Building Height = 325 ft.

- 2. You are analyzing the sale of an office building, and only the property's selling price and its stabilized Net Rental Income are known. TRUE OR FALSE: Based solely on this information, you could, in fact, approximate the effective Cap Rate for the transaction.**
- a. True.
 - b. False.
 - c. It depends on the type of lease(s) – you could determine the Cap Rate if Triple Net (NNN) leases are used, but not if N or NN leases are used.
 - d. It depends on the type of lease(s) – you could determine the Cap Rate if Single Net (N) or Double Net (NN) leases are used, but not if NNN leases are used.
- 3. You are building a real estate development model for a new office complex. Which of the following expenses should you LINK DIRECTLY to the GROSS Square Footage, as opposed to the Rentable Square Footage or Lot Square Footage or something else?**
- a. Land Acquisition Costs.
 - b. Hard Costs.
 - c. Soft Costs.
 - d. Furniture, Fixtures, & Equipment (FF&E).
 - e. Tenant Improvements (TI).
 - f. None of the above – all expenses should be linked to Lot Square Footage or Rentable Square Footage since you only pay for land and usable space.

4. For this question and the next 3 questions, please review the screenshot below, which shows the Debt & Equity Schedules for an office complex development in month 1 through month 14 (the initial stages of the project):

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	
19	Debt and Equity Schedules - Gekko Offices																			
20	(\$ in US Dollars as Stated)																			
21																				
22																				
23	Month #:		1	2	3	4	5	6	7	8	9	10	11	12	13	14				
24	Construction Month #:		0	0	0	0	0	0	0	0	0	0	0	0	0	0				
25	Construction Status:		1	1	1	1	1	1	1	1	1	1	1	1	1	1				
26	Office Tenant Move-In Month:		0	0	0	0	0	0	0	0	0	0	0	0	0	0				
27																				
28	Calendar Year Number:		1	1	1	1	1	1	1	1	1	1	1	1	1	2	2			
29																				
30	Interest Expense on Debt:																			
31	Mezzanine:	13.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32	Senior Notes B:	8.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33	Senior Notes A:	6.0%	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
34	Total Interest Expense:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
35																				
36	Equity & Debt Ending Balances:																			
37	Developer Equity:	-	1,433,500	1,567,000	1,963,195	1,963,195	1,963,195	1,963,195	1,963,195	1,963,195	1,963,195	1,963,195	1,963,195	1,963,195	1,963,195	1,963,195	1,963,195	1,963,195	1,963,195	1,963,195
38	Investor Equity:	-	-	-	4,305	671,805	805,305	872,055	1,406,055	1,472,805	1,606,305	1,739,805	1,873,305	2,006,805	2,407,305	2,741,055				
39	Mezzanine:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40	Senior Notes B:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
41	Senior Notes A:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
42	Cumulative Capital Drawn:	-	1,433,500	1,567,000	1,967,500	2,635,000	2,768,500	2,835,250	3,369,250	3,436,000	3,569,500	3,703,000	3,836,500	3,970,000	4,370,500	4,704,250				
43																				
44	Financing Costs & Operating Deficit:																			
45	Capitalized Interest - Mezzanine:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
46	Capitalized Interest - Senior Notes B:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
47	Capitalized Interest - Senior Notes A:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
48	Origination Costs & Taxes - Mezzanine:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
49	Origination Costs & Taxes - Senior Notes B:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
50	Origination Costs & Taxes - Senior Notes A:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51	Operating Deficit:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	Total Financing Costs & Operating Deficit:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53																				
54	Total Funds Required for Development & Operation:		1,433,500	133,500	400,500	667,500	133,500	66,750	534,000	66,750	133,500	133,500	133,500	133,500	133,500	400,500	333,750			
55																				
56	Equity & Debt Draws:																			
57	Developer Equity:	1,963,195	1,433,500	133,500	396,195	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
58	Investor Equity:	17,668,752	-	-	4,305	667,500	133,500	=MIN(K5104:SUM(K5105:K107),50108-SUM(SE108:J108))	-	-	133,500	133,500	133,500	133,500	400,500	333,750				
59	Mezzanine:	14,723,968	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	Senior Notes B:	14,355,906	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61	Senior Notes A:	29,447,920	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
62	Total Capital Draws:		1,433,500	133,500	400,500	667,500	133,500	66,750	534,000	66,750	133,500	133,500	133,500	133,500	400,500	333,750				
63																				
64	Cash Flow Available to Repay Debt:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
65																				
66	Optional Debt Repayments:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
67	Senior Notes A:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
68	Senior Notes B:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
69	Mezzanine:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	Total Optional Debt Repayments:		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Notice how the “Operating Deficit” highlighted in red above is \$0 in these first 14 months, when the property is still under construction and not yet generating revenue. How can this possibly be correct, given that there are still expenses at this stage?

- It is a mistake in the model – there must, in fact, be some type of Operating Deficit given that there are true cash expenses but no cash income yet.
- It means that the planned debt and equity draws are sufficient to cover the funding required for construction in the first 14 months, so no additional draws are required.
- It’s because “Operating Deficit” only refers to Net Rental Income – Operating Expenses – Property Taxes and NOT the construction costs (i.e. “CapEx”).
- None of the above – the Operating Deficit should always be \$0 in a real estate development model to ensure that the Sources of Funds equals the Uses of Funds.

5. In the screenshot above, the formula for “Investor Equity” in cell K108 under Equity & Debt Draws is shown as: =MIN(K\$104-SUM(K\$105:K107), \$D108-SUM(\$108:J108)). Which of the following statements represent CORRECT explanations of this formula?

- a. The MIN formula ensures that we take the lesser of 1) The total funds required; or 2) The remaining amount of Investor Equity we are able to draw on, given the maximum draw allowed and the cumulative amount drawn so far.
- b. The formula is set up to draw on Investor Equity BEFORE the maximum allowable Developer Equity is drawn on since Investor Equity has a lower cost of capital.
- c. The formula is set up to draw on Debt BEFORE Equity since drawing on Equity first will reduce the IRR.
- d. The SUM formula ensures that we never draw on Investor Equity over and above the hard limit set in the beginning.

6. Consider the screenshots below, which show the Income Statement and Cash Flow Statement for this same property over the same period (the first 14 months of the development):

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	
1																				
2		Income Statement - Gekko Offices																		
3		(\$ in US Dollars as Stated)																		
4																				
5		Month #:	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
6		Construction Month #:	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
7		Construction Status:	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
8		Office Tenant Move-In Month:	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
9		Calendar Year Number:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2		
10																				
11		Revenue:																		
12		Office Tenants - Potential Revenue:	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	
13		Less: Vacancy Allowance:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
14		Parking Revenue:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
15		Total Revenue:	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	
16		Operating Expenses & Property Taxes:																		
17		Office Operating Expenses:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
18		Parking Operating Expenses:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
19		Property Taxes:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
20		Total Operating Expenses & Property Taxes:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
21		Net Operating Income (NOI):	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	
22		Cash Interest Expense:																		
23		Mezzanine Interest Expense:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
24		Senior Notes & Interest Expense:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
25		Senior Notes & Interest Expense:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
26		Total Cash Interest Expense:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
27		Net Income:	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	-	\$	

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
34	Cash Flow Statement - Gokko Offices																		
35	(\$ in US Dollars as Stated)																		
36																			
37																			
38	Month #:	1	2	3	4	5	6	7	8	9	10	11	12	13	14				
39	Construction Month #:	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
40	Construction Status:	1	1	1	1	1	1	1	1	1	1	1	1	1	1				
41	Office Tenant Move-In Month:	0	0	0	0	0	0	0	0	0	0	0	0	0	0				
42																			
43	Calendar Year Number:	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2	2		
44																			
45	Cash Flow from Operations:																		
46	Net Income:	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
47	Total Cash Flow from Operations:																		
48																			
49	Cash Flow from Investing:																		
50	Land Acquisition Costs:	(1,300,000)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
51	Hard Costs:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
52	Tenant Improvements (TIs):	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
53	Soft Costs:	(133,500)	(133,500)	(400,500)	(667,500)	(133,500)	(66,750)	(534,000)	(66,750)	(133,500)	(133,500)	(133,500)	(133,500)	(400,500)	(333,750)				
54	FF&E Costs:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
55	Total Cash Flow from Investing:	(1,433,500)	(133,500)	(400,500)	(667,500)	(133,500)	(66,750)	(534,000)	(66,750)	(133,500)	(133,500)	(133,500)	(133,500)	(400,500)	(333,750)				
56																			
57	Cash Flow from Financing:																		
58	Financing Costs & Capitalized Interest:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
59	Developer Equity Draws:	1,433,500	133,500	396,195	667,500	133,500	66,750	534,000	66,750	133,500	133,500	133,500	133,500	400,500	333,750				
60	Investor Equity Draws:	-	-	4,305	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
61	Net Change in Mezzanines:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
62	Net Change in Senior Notes B:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
63	Net Change in Senior Notes A:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
64	Total Cash Flow from Financing:	1,433,500	133,500	400,500	667,500	133,500	66,750	534,000	66,750	133,500	133,500	133,500	133,500	400,500	333,750				
65																			
66	Net Change in Cash:	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
67																			

Based on these screenshots and the one shown under question #4, which of the following conditions must be true if debt is REPAID in this model (i.e. at least one of the “Optional Debt Repayment” rows in the first screenshot above has a non-zero number)?

- Cash Flow from Operations must be positive.
- (Net Operating Income – Cash Interest Expense) must be positive.
- (Cash Flow from Operations – Cash Flow from Investing – Cash Flow from Financing) must be positive.
- (Net Income – Cash Interest Expense) must be positive.
- (Net Operating Income – Total Interest Expense) must be positive.

7. The fact that we draw on equity and debt over time, as funding is required each month, makes this model significantly more complicated than a traditional LBO model, where the equity and debt is raised upfront when the transaction closes. Why can we NOT make this same assumption here and say that all the debt and equity is drawn on in the beginning, before development starts?

- a. Because drawing on all the debt and equity upfront would lower the IRR, which would be unacceptable to both the developer and the 3rd party investors.
- b. Drawing on all the debt upfront would result in higher interest expense, which would be pointless because the developer wouldn't need all the funds initially.
- c. Since the expenses are paid out gradually over time, it makes more sense to draw on different funding sources incrementally to reduce risk and boost the IRR.
- d. None of the above – drawing on all the financing sources at once would simplify the model, and we might very well change the model to do that here.

8. For this question and the next 5 questions, please review the screenshots below for a waterfall distribution of returns to the developer and the 3rd party investors:

Exhibit 2.8.1 – Month 1 through Month 11 of Tier 1 IRR and Tier 2 IRR Distributions

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
122	Returns and IRR Calculation - Gekko Offices															
123	(\$ in US Dollars as Stated)															
124																
125																
126	Month #:			1	2	3	4	5	6	7	8	9	10	11		
127	Construction Month #:			0	0	0	0	0	0	0	0	0	0	0		
128	Construction Status:			1	1	1	1	1	1	1	1	1	1	1		
129	Office Tenant Move-In Month:			0	0	0	0	0	0	0	0	0	0	0		
130																
131	Calendar Year Number:			1	1	1	1	1	1	1	1	1	1	1		
132																
133	Project Equity Flows:															
134	Invested Equity:			(1,433,500)	(133,500)	(400,500)	(667,500)	(133,500)	(66,750)	(534,000)	(66,750)	(133,500)	(133,500)	(133,500)		
135	Distributions from Sale of Building:			-	-	-	-	-	-	-	-	-	-	-		
136	Total Project Equity Flows:			(1,433,500)	(133,500)	(400,500)	(667,500)	(133,500)	(66,750)	(534,000)	(66,750)	(133,500)	(133,500)	(133,500)		
137																
138	Investor Equity Investment:			-	-	(4,305)	(667,500)	(133,500)	(66,750)	(534,000)	(66,750)	(133,500)	(133,500)	(133,500)		
139																
140	Tier 1 - IRR Through:			10.0%												
141	Beginning Balance:			-	-	-	4,305	671,840	810,697	883,912	1,424,960	1,503,073	1,648,559	1,795,204		
142	Investor Injections:			-	-	4,305	667,500	133,500	66,750	534,000	66,750	133,500	133,500	133,500		
143	Investor Accruals:			-	-	-	=141*((1+SE\$140)^(1/Months)-1)	-	-	7,048	11,363	11,986	13,146	14,315		
144	Tier 1 Accrual Distribution:			-	-	-	-	-	-	-	-	-	-	-		
145	Ending Balance:			-	-	4,305	671,840	810,697	883,912	1,424,960	1,503,073	1,648,559	1,795,204	1,943,020		
146																
147	Investor Cash Flow:			90.0%	-	-	(4,305)	(667,500)	(133,500)	(66,750)	(534,000)	(66,750)	(133,500)	(133,500)	(133,500)	
148	Developer Cash Flow:			10.0%	-	-	-	-	-	-	-	-	-	-	-	
149	Developer Promote Cash Flow:			0.0%	-	-	-	-	-	-	-	-	-	-	-	
150																
151	Remaining Cash to Distribute:			-	-	-	-	-	-	-	-	-	-	-		
152																
153	Tier 2 - IRR Through:			15.0%												
154	Beginning Balance:			-	-	-	4,305	671,856	813,227	889,503	1,433,924	1,517,472	1,668,749	1,821,798		
155	Investor Injections:			-	-	4,305	667,500	133,500	66,750	534,000	66,750	133,500	133,500	133,500		
156	Investor Accruals:			-	-	-	50	7,871	9,527	10,420	16,798	17,777	19,549	21,342		
157	Tier 1 Accrual Distribution:			-	-	-	-	-	-	-	-	-	-	-		
158	Tier 2 Accrual Distribution:			-	-	-	-	-	-	-	-	-	-	-		
159	Ending Balance:			-	-	4,305	671,856	813,227	889,503	1,433,924	1,517,472	1,668,749	1,821,798	1,976,641		
160																

Exhibit 2.8.2 – Month 1 through Month 3 and Month 56 through Month 60 of Tier 1 IRR and Tier 2 IRR Distributions

Returns and IRR Calculation - Gekko Offices									
(\$ in US Dollars as Stated)									
Month #:		1	2	3	56	57	58	59	60
Construction Month #:		0	0	0					
Construction Status:		1	1	1	3	3	3	3	3
Office Tenant Move-In Month:		0	0	0	6	6	6	6	6
Calendar Year Number:		1	1	1	5	5	5	5	5
Project Equity Flows:									
Invested Equity:		(1,433,500)	(133,500)	(400,500)	-	-	-	-	-
Distributions from Sale of Building:		-	-	-	-	-	-	-	40,758,565
Total Project Equity Flows:		(1,433,500)	(133,500)	(400,500)	-	-	-	-	40,758,565
Investor Equity Investment:		-	-	(4,305)	-	-	-	-	-
Tier 1 - IRR Through:	10.0%								
Beginning Balance:		-	-	-	24,239,363	24,432,651	24,627,480	24,823,863	25,021,812
Investor Injections:		-	-	4,305	-	-	-	-	-
Investor Accruals:		-	-	-	193,288	194,829	196,383	197,949	199,527
Tier 1 Accrual Distribution:		-	-	-	-	-	-	-	(25,221,340)
Ending Balance:		-	-	4,305	24,432,651	24,627,480	24,823,863	25,021,812	-
Investor Cash Flow:	90.0%	-	-	(4,305)	-	-	-	-	25,221,340
Developer Cash Flow:	10.0%	-	-	-	-	-	-	-	2,802,371
Developer Promote Cash Flow:	0.0%	-	-	-	-	-	-	-	-
Remaining Cash to Distribute:		-	-	-	-	-	-	-	12,734,854
Tier 2 - IRR Through:	15.0%								
Beginning Balance:		-	-	-	28,097,637	28,426,798	28,759,816	29,096,735	29,437,600
Investor Injections:		-	-	4,305	-	-	-	-	-
Investor Accruals:		-	-	-	329,161	333,018	336,919	340,866	344,859
Tier 1 Accrual Distribution:		-	-	-	-	-	-	-	(25,221,340)
Tier 2 Accrual Distribution:		-	-	-	-	-	-	-	(4,561,120)
Ending Balance:		-	-	4,305	28,426,798	28,759,816	29,096,735	29,437,600	-
Investor Cash Flow:	80.0%	-	-	-	-	-	-	-	-
Developer Cash Flow:	10.0%	-	-	-	-	-	-	-	-
Developer Promote Cash Flow:	10.0%	-	-	-	-	-	-	-	-
Remaining Cash to Distribute:		-	-	-	-	-	-	-	-

Exhibit 2.8.3 – Month 54 through Month 60 of Tier 2 IRR and Tier 3 IRR Distributions

Returns and IRR Calculation - Gekko Offices								
(\$ in US Dollars as Stated)								
Month #:	54	55	56	57	58	59	60	
Construction Month #:								
Construction Status:	3	3	3	3	3	3	3	
Office Tenant Move-In Month:	5	6	6	6	6	6	6	
Calendar Year Number:	5	5	5	5	5	5	5	
Project Equity Flows:								
Invested Equity:	-	-	-	-	-	-	-	-
Distributions from Sale of Building:	-	-	-	-	-	-	-	40,758,565
Total Project Equity Flows:	-	-	-	-	-	-	-	40,758,565
Remaining Cash to Distribute:	-	-	-	-	-	-	-	12,734,854
Tier 2 - IRR Through:								
Beginning Balance:	27,450,704	27,772,287	28,097,637	28,426,798	28,759,816	29,096,735	29,437,600	
Investor Injections:	-	-	-	-	-	-	-	-
Investor Accruals:	321,583	325,350	329,161	333,018	336,919	340,866	344,859	
Tier 1 Accrual Distribution:	-	-	-	-	-	-	-	(25,221,340)
Tier 2 Accrual Distribution:	-	-	-	-	-	-	-	(4,561,120)
Ending Balance:	27,772,287	28,097,637	28,426,798	28,759,816	29,096,735	29,437,600	-	
Investor Cash Flow:	-	-	-	-	-	-	-	4,561,120
Developer Cash Flow:	-	-	-	-	-	-	-	570,140
Developer Promote Cash Flow:	-	-	-	-	-	-	-	570,140
Remaining Cash to Distribute:	-	-	-	-	-	-	-	7,033,454
Tier 3 - IRR Through:								
Beginning Balance:	31,401,952	31,882,699	32,370,806	32,866,386	33,369,553	33,880,423	34,399,115	
Investor Injections:	-	-	-	-	-	-	-	-
Investor Accruals:	480,747	488,107	495,580	503,167	510,870	518,691	526,632	
Tier 1 Accrual Distribution:	-	-	-	-	-	-	-	(25,221,340)
Tier 2 Accrual Distribution:	-	-	-	-	-	-	-	(4,561,120)
Tier 3 Accrual Distribution:	-	-	-	-	-	-	-	(4,923,418)
Ending Balance:	31,882,699	32,370,806	32,866,386	33,369,553	33,880,423	34,399,115	-	219,869

In Exhibit 2.8.1 above, the formula for “Investor Accruals” is shown in cell I143 as: $=I141 * ((1+\$E\$140)^{(1/\text{Months})}-1)$. Which of the following statements CORRECTLY describe what this formula represents?

- a. It represents the MONTHLY cash flow that would correspond to a 10% IRR on the cumulative amount of equity invested so far.
- b. It represents a “plug” in the Waterfall Returns schedule to ensure that the “Tier 1 Ending Balance” in the final month of the model always equals \$0.
- c. It ensures that the “Remaining Cash to Distribute” line item (row 151) remains at \$0 except for the final month in the Waterfall Returns schedule.
- d. In the final month of the model (month 60), the number calculated in this row plus the “Beginning Balance” above it represent the cash flow that 3rd Party Investors would receive upon exit.

9. Suppose that the developer promotes in this distribution schedule did not exist at all. Would that be BETTER or WORSE for the 3rd party investors and the developers?

- a. It would be BETTER for 3rd party investors and WORSE for the developers.
- b. It would be WORSE for the 3rd party investors and BETTER for the developers.
- c. It would be WORSE for the 3rd party investors and WORSE for the developers.
- d. It would be BETTER for the 3rd party investors and BETTER for the developers.
- e. None of the above – you cannot know for certain as it depends on how much the developer promotes influence the overall IRR.

10. In Exhibit 2.8.3 above, at very end of the Waterfall Schedule (Month 60) there is approximately \$25.2 million in the “Tier 1 Accrual Distribution” row and approximately \$4.6 million in the “Tier 2 Accrual Distribution” row (Note: Refer to the second to last section from the bottom, outlined in red). The Total Cash Flows to Equity Investors in Month 60 are \$40.8 million, and the remaining Cash to Distribute AFTER Tier 1 but BEFORE Tier 2 and all tiers above Tier 2 is approximately \$12.7 million.

Which of the following statements is TRUE regarding the total amount of cash distributed to 3rd party investors PLUS developers PLUS developer promotes in this final month?

- a. The total amount of cash distributed to all those groups is LESS THAN \$4.6 million.
- b. The total amount of cash distributed to all those groups is EQUAL TO \$4.6 million.
- c. The total amount of cash distributed to all those groups is GREATER THAN \$4.6 million.
- d. You cannot determine how much cash all these groups will receive based only on this information – we would need to see more of the model first.

11. Which of the following statements are TRUE regarding what the “Ending Balance” line item in the final month of the Tier 3 IRR section shown above in Exhibit 2.8.3 means?

- a. It represents the ADDITIONAL amount of cash the project would need to generate to go beyond the 20% IRR hurdle level.
- b. Since this number is greater than \$0, it means that we have enough funds to move to the next IRR hurdle and distribute them there.
- c. Since this number is greater than \$0, it means that we do NOT have enough funds to move to the next IRR hurdle and distribute them there.
- d. None of the above – the Tier 3 IRR Ending Balance has no specific meaning and will be used only for calculations elsewhere in the schedule.

12. You're reviewing the output of a Waterfall Returns schedule, such as the one shown above, and you notice that the TOTAL project IRR to all investors exceeds the IRR to 3rd party equity investors. What is the MOST likely explanation for this?

- a. Too much debt was used, which impacted the 3rd party equity investors disproportionately since they contributed a greater percentage of equity.
- b. The project underperformed and the 3rd party equity investors suffered more since they contributed equity earlier on in the development process.
- c. This likely happened because interest was capitalized for too long a period, instead of being paid out in cash once the property became cash flow-positive.
- d. In all likelihood, this happened because the overall IRR met the hurdle rates for the tiers where developer promotes were used – and so the developers got a greater percentage of the total project IRR past a certain level.

13. How would the office complex development model shown here be different for a retail development instead?

- a. The figures for Rent and Operating Expenses per Square Foot would be different.
- b. The owner might use different lease types with the tenants.
- c. You would NOT need the Waterfall Returns schedule.
- d. You might see attached structures such as residences or parking garages, whereas they would not be common with an office development.

14. We have finished an office complex development model and created sensitivity tables to analyze the 5-year IRR and how it is impacted by Rent Per Square Foot, the Exit Cap Rate, and the Lot Square Footage of the property. Please review the two tables below to see the output of this analysis:

		Average Annual Office Rent Per Square Foot:									
		\$ 70.00	\$ 72.50	\$ 75.00	\$ 77.50	\$ 80.00	\$ 82.50	\$ 85.00	\$ 87.50	\$ 90.00	
Cap Rate at Time of Building Sale:	6.0%	23.8%	28.1%	32.0%	35.6%	38.9%	42.1%	45.0%	47.7%	50.3%	
	6.3%	20.2%	24.7%	28.7%	32.4%	35.9%	39.1%	42.0%	44.9%	47.5%	
	6.5%	16.5%	21.2%	25.4%	29.3%	32.8%	36.1%	39.2%	42.0%	44.7%	
	6.8%	12.7%	17.7%	22.1%	26.1%	29.8%	33.2%	36.3%	39.3%	42.0%	
	7.0%	8.9%	14.2%	18.8%	23.0%	26.8%	30.3%	33.5%	36.5%	39.4%	
	7.3%	4.9%	10.6%	15.5%	19.8%	23.8%	27.4%	30.7%	33.8%	36.7%	
	7.5%	0.8%	6.9%	12.1%	16.7%	20.8%	24.5%	28.0%	31.2%	34.2%	
	7.8%	(3.6%)	3.0%	8.6%	13.4%	17.8%	21.7%	25.2%	28.5%	31.6%	
	8.0%	0.0%	(1.0%)	5.0%	10.2%	14.7%	18.8%	22.5%	25.9%	29.0%	
	8.3%	0.0%	0.0%	1.3%	6.8%	11.6%	15.9%	19.7%	23.2%	26.5%	

		Lot Square Footage:								
		11,000	12,000	13,000	14,000	15,000	16,000	17,000	18,000	19,000
Cap Rate at Time of Building Sale:	6.0%	33.0%	34.8%	36.4%	37.8%	38.9%	40.0%	40.9%	41.7%	42.5%
	6.3%	29.7%	31.6%	33.2%	34.6%	35.9%	36.9%	37.9%	38.7%	39.5%
	6.5%	26.5%	28.4%	30.1%	31.6%	32.8%	33.9%	34.9%	35.7%	36.5%
	6.8%	23.2%	25.3%	27.0%	28.5%	29.8%	30.9%	31.9%	32.8%	33.6%
	7.0%	19.9%	22.1%	23.9%	25.5%	26.8%	28.0%	29.0%	29.9%	30.7%
	7.3%	16.7%	18.9%	20.8%	22.4%	23.8%	25.0%	26.1%	27.0%	27.9%
	7.5%	13.3%	15.7%	17.7%	19.3%	20.8%	22.0%	23.2%	24.1%	25.0%
	7.8%	9.9%	12.4%	14.5%	16.2%	17.8%	19.1%	20.2%	21.3%	22.2%
	8.0%	6.4%	9.1%	11.3%	13.1%	14.7%	16.1%	17.3%	18.4%	19.3%
	8.3%	2.8%	5.6%	8.0%	9.9%	11.6%	13.0%	14.3%	15.4%	16.4%

Suppose that we wanted to INCREASE the overall 5-year IRR of this project by tweaking some or all of the variables shown in the sensitivity tables. What is the MOST REALISTIC way to do this?

- a. Sell the property at a lower Exit Cap Rate, i.e. at a higher valuation.
- b. Increase the average Rent Per Square Foot for the property.
- c. Increase the Lot Size by buying a bigger piece of land in the beginning.
- d. None of the above – the best way to increase the IRR is to reduce the investor equity contribution and use more debt instead.

15. Why might we adjust for inflation when calculating the proceeds from the sale of the property at the end, but not when calculating the revenue, expenses, and financing projections in the model itself?

- a. To be more conservative in our assumptions.
- b. Because accounting for inflation in the model would create additional circular references, which would make the model more difficult to modify.
- c. There will almost certainly be some inflation after 5 years, but it may be tougher to predict the rate of inflation in each individual year of the model.
- d. The question premise is false – we NEVER factor in inflation when calculating sales proceeds since it is already factored into the model itself.

16. You're reviewing a real estate development model and you notice that Net Operating Income (NOI) is calculated slightly differently in different places in the model. Which one of the following answer choices MOST likely describes the discrepancies you find?

- a. Maintenance CapEx IS subtracted from NOI in the initial assumptions in the model, but it is NOT subtracted from the NOI number used to calculate the Net Sale Proceeds at the end.
- b. Maintenance CapEx is NOT subtracted from NOI in the initial assumptions in the model, but it IS subtracted from the NOI number used to calculate the Net Sale Proceeds at the end.
- c. The figures for operating expenses and property taxes will change over time, so the NOI calculation differs slightly to reflect that.
- d. Sometimes the vacancy allowance is netted against rental income when calculating NOI, and in other cases it is not.