Excellence with Excel
– Certification Quiz Questions
Module 3 – Financial Formulas and Lookup Functions

1. **Which of the following choices is/are VALID formulas in Excel that will ALSO produce the desired results?**

   a. =SUMIF(C5:C20,">1/1/2019",B5:B20)

   b. =SUMIF(C5:C20,'>1/1/2019',B5:B20)

   c. =SUMIF(C5:C20,">"&"1/1/2019",B5:B20)

   d. =SUMIF(B5:B20,<&D2,B5:B20)

   e. =SUMIF(B5:B20,"<D2",B5:B20)

   f. =SUMIF(B5:B20,"<"&D2,B5:B20)

   g. =COUNTIF(C5:C20,"<"&1/1/2020)

   h. =COUNTIF(C5:C20,"<1/1/2020")

   i. Answer choices 1, 3, 6, and 8.

   j. Answer choices 1, 5, and 7.

   k. Answer choices 3, 4, and 7.

   l. Answer choices 1, 3, 5, 6, 7, and 8.

   m. Answer choices 1, 3, 5, and 7.

2. You want to write a summation formula for a range of cells in another spreadsheet, named Scratch-2. You write the following formula, but Excel does not accept it as a proper entry:

=SUM(Scratch-2!B5:B20)

What is the MOST LIKELY reason why this formula generates an error?

a. The B5:B20 range of cells does not exist in the Scratch-2 spreadsheet.

b. You should be using double quotes around the Scratch-2 name since it's a reference to another spreadsheet.

c. You should be using single quotes around the Scratch-2 name since the hyphen is considered a special character.

d. The exclamation mark is redundant since Scratch-2 is in the same file (workbook) as the current spreadsheet.

3. **You've imported a set of first names, last names, and titles (e.g., Mr. and Mrs.) for a set of employees. What is the most efficient way to fix the missing periods and incorrect capitalization shown in the screenshot below?**

	A	B	C
1			
2		mrs. Alice Hines	
3		Mr ismael Warner	
4		mr. Kenny reyes	
5		MR dean King	
6		mr. Bruce hayes	
7		MS Yolanda fowler	
8		Mrs. Anita dennis	
9		miss ann Glover	
10		Mrs. Paula mckinney	
11		Mrs lydia Freeman	
12			

a. First, use the PROPER function to fix the capitalization, and then use the SUBSTITUTE function to detect text such as "Mr " and replace it with "Mr.".

b. Write a single function that uses LEFT to retrieve the leftmost 4 characters, checks their contents in an IF statement, and then replaces them with a different title, if necessary, and joins the replacement with the rest of the text; wrap a PROPER function around everything.

c. Use the Text to Columns feature in Excel to separate the parts of these names into separate columns, and then use SUBSTITUTE on the first part to detect incorrect titles and PROPER on the rest, and join them together with &.

d. Use a combined TRIM, PROPER, and CLEAN function to add the periods and fix the capitalization of all these names automatically.

4. **You are modifying a summation formula that references a Customer Order data table on another spreadsheet in the same file. You have written the formula shown below, but it does not work properly. What is the problem?**

	A	B	C	D	E	F	G	H
1								
2		Summary and Analysis of Due Diligence Data - Customer Orders						
3								
4		Sales Data and Statistics by Year:						
5			Total	Average	Total # of	Total	Minimum	Maximum
6		Year:	Sales:	Order Size:	Orders:	Commissions:	Order:	Order:
7		2016	=SUMIFS(Order_Table[Order Date],>=B7,Order_Table[Order Date],<B8,Order_Table[Amount])					
8		2017	2,965,850	164,769	18	444,878	130,140	212,181
9		2018	6,211,826	200,381	31	854,654	152,840	247,084
10		2019	12,074,872	232,209	52	1,626,392	179,026	294,208
11		2020	22,000,859	275,011	80	2,878,891	200,199	349,898
12		2021	33,973,085	311,680	109	4,351,913	232,239	399,753
13		2022	42,930,202	343,442	125	5,056,366	250,174	448,996
14		2023	61,048,714	388,845	157	6,906,900	300,835	499,546
15		2024	90,993,446	497,232	183	9,854,571	400,117	596,090
16		2025	135,147,098	570,511	236	14,472,759	450,506	698,189
17		2026						

a. The input order is incorrect – with SUMIFS, the summation range, Order_Table[Amount], should come first.

b. The inputs are missing double quotes around the >= and < operators, and they do not use the & character to join those operators to cell references B7 and B8.

c. Since Order_Table is on another spreadsheet, the B7 and B8 references must include the name of the current spreadsheet followed by an exclamation mark.

d. Answer choices 1 and 2.

e. Answer choices 2 and 3.

f. Answer choices 1 and 3.

g. Answer choices 1, 2, and 3.

5. **Consider the data shown below. What results would the COUNT and COUNTA functions produce when applied to this entire range, from F2 to F17?**

	E	F	G
1			
2		fist	
3		(690) 391-5169	
4		specimen	
5		5	
6		mobile	
7		domestic	
8		6	
9		7	
10		8	
11		form	
12		2025-01-12	
13		(830) 845-0418	
14			
15		turkey	
16		2025-06-30	
17		gap	

a. COUNT will produce 15, and COUNTA will produce 6.

b. COUNT will produce 6, and COUNTA will produce 15.

c. COUNT will produce 4, and COUNTA will produce 15.

d. COUNT will produce 8, and COUNTA will produce 15.

6. **Suppose that you want to use the IRR function with the following set of cash flows to estimate the annualized rate of return. Why will it NOT work correctly?**

	A	B	C	D	E	F	G	H	I	J	K
10											
11			**Cash Flows:**			**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
12			Rental Income:			$	13	$	24 $	12 $	13
13			Property (Purchase) / Sale:			(175)					225
14			**Net Cash Flows:**			$ (175) $	13	$	24 $	12 $	238
15											
16			**Internal Rate of Return (IRR):=IRR(F14:K14)**								

a. This statement is incorrect – the function will work correctly since the first cash flow is negative, and all the cash flows after it are positive.

b. The cash flow amounts are irregular during this holding period, so you need to use the XIRR function instead.

c. If the cash flows are 0 in one period, such as in Year 2, you must enter a hard-coded 0 or formula that produces 0 rather than leaving the cell blank.

d. The IRR function does not accept a mix of constant and formula inputs, so you should change all the cash flows to one or the other.

7. **Your co-worker does not believe the results of your IRR calculation, so he checks to see if IRR truly represents the annualized rate of return. To do this, he makes the upfront investment the "starting balance" and then compounds it by the IRR you calculated each year.**

His balance in the final year does not match the net cash flows or property selling price in that year, so he argues that your calculation is wrong. Based on the screenshot below, is he correct?

	A B	C	D	E	F	G	H	I	J	K
17										
18		"Asking Price" (Initial Investment):			$ Thousands		$ 150			
19		Annual Cash Flow from Tenants' Rent:			$ Thousands		12			
20		Apartment Sale Value:			$ Thousands		200			
21										
22		**Cash Flows:**			**Year 0**	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**
23		Rental Income:				$ 12	$ 12	$ 12	$ 12	$ 12
24		Property (Purchase) / Sale:			(150)	-	-	-	-	200
25		**Net Cash Flows:**			$ (150)	$ 12	$ 12	$ 12	$ 12	$ 212
26										
27		**Internal Rate of Return (IRR):**			**13.1%**					
28										
29		**Starting Balance:**			$ 150					
30		**Compounded @ 13.1% IRR Each Year:**				$ 170	$ 192	$ 217	$ 246	$ 278

a. Yes – IRR should always represent the "effective compounded interest rate" or "annualized rate of return," so this 13.1% figure is incorrect.

b. No – your co-worker is not subtracting the $12 in rental income from the running investment balance each year, so his calculations are off.

c. No – the final balance in this calculation should equal the *total cumulative* rental income + property selling price.

d. You would need to see the formulas for both calculations to tell who's correct.

8. **You're evaluating the same set of cash flows for use in another schedule of the model, but now the dates are irregular rather than exactly one year apart, as shown below. Will the annualized rate of return produced by the XIRR function be higher or lower than the one produced by the standard IRR function?**

				2020-12-31	2022-06-30	2023-06-30	2023-12-31	2024-06-30	2025-12-31
Irregular Cash Flows:									
Rental Income:				$ -	$ 12	$ 12	$ 12	$ 12	12
Property (Purchase) / Sale:				(150)	-	-	-	-	200
Net Cash Flows:				$ (150)	$ 12	$ 12	$ 12	$ 12	212
Internal Rate of Return (IRR):=XIRR(F35:K35,F32:K32)									

a. Slightly lower, since the rental income in the first and second years is generated after the ends of Years 1 and 2.

b. About the same, since the property sale still occurs exactly 5 years after the initial purchase.

c. Slightly higher, since the rental income starts on a later date and arrives closer to the property sale in Year 5.

d. It's impossible to say because the Year 4 rental income arrives before the end of Year 4, which offsets the later arrival of the rental income in Years 1 and 2.

9. **You've written a YIELD function in Excel to calculate the Yield to Maturity (YTM) of a bond with the characteristics shown below. Based ONLY on these numbers, what can you predict about this bond's YTM?**

Bond Yields, Pricing, and Duration

Settlement Date (Purchase Date):	Date	2020-12-31
Bond Coupon Rate (Fixed Interest Rate):	%	5.40%
Bond Principal or Par Value:	$	$ 100.0
Bond Current Market Price:	$	90.0
Bond Maturity (Repayment Date):	Date	2030-12-31
Bond Redemption Value % Par Value:	#	90.0
Prevailing Yields on Similar Bonds:	%	5.50%
Yield to Maturity (YTM):	%	=YIELD(H138,H143,H139,H141,H144,2)

a. It will likely be above the bond's fixed interest rate of 5.40% because the bond trades at a 10% discount to par value, which makes more of an impact than the 10% discount on the redemption value.

b. It's difficult to say anything definitive because the 10% discount to par value and the 10% discount on the redemption value offset each other.

c. It will be above the bond's fixed interest of 5.40% but below the 5.50% yield on similar bonds because the 5.50% yield acts as a ceiling.

d. It will be below the bond's fixed interest rate of 5.40% because losing 10% of the principal upon maturity makes more of a difference than paying 10% less upfront.

10. You're trying to set up date and title headers in a new financial model. You've selected the area you want to replicate in the other schedules, as shown below. What is the most EFFICIENT and FLEXIBLE way to set up this same header in the other schedules?

E20 =EOMONTH(F20,-12)

Segment Projections:		Units:	Historical:				Projected:				
			FY16	FY17	FY18	FY19	FY20	FY21	FY22	FY23	FY24

a. Go to the other schedule, create direct links to everything in this one, and then anchor each direct link individually with absolute references.

b. Use the Paste Formulas command (Alt, E, S, F or Ctrl + ⌘ + V, F) to copy and paste the formulas but not the borders, number formats, fills, or fonts, and then anchor the formulas individually.

c. Use the standard Copy/Paste commands (Ctrl + C and Ctrl + V, or ⌘ + C and ⌘ + V) to copy and paste everything down to other schedules and then anchor the formulas individually.

d. Use the Paste Links command (Alt, E, S, L or Ctrl + ⌘ + V, L) to paste direct links to everything and then anchor the cell references individually.

11. You want to write a VLOOKUP formula to retrieve the Order Amount for the first person whose First Name starts with "B" followed by any 5 letters, then "c" and then anything after the c. Based on the screenshot below, which of the following formulas will do this correctly? The data table is called "Orders" in Excel.

First Name	Last Name	Company Name	Telephone	Address	City	State	Postal Code	Amount	Order Date	Sales Rep ID	Commissions
Haywood	Meza	Huels, Schuster and Daugherty	810-230-6924	P.O. Box 42524	Matteson village	MN	55503	$ 108,063	2016-01-15	1	$ 16,209
Marybelle	Serrano	Schamberger, Yost and Dach	885-388-7212	515 Silver Highlands	Natalbany	WY	00462	180,394	2016-04-01	1	27,059
Jim	van der Mheen	Stokes, Rutherford and Bauch	728-272-7491	939 Clear Edge	Mesita	WV	14424	100,003	2016-04-19	1	15,000
Shenita	Davenport	Waelchi Inc	267-625-9210	873 Iron Third Harbor	Whelen Springs	NM	37783	183,593	2016-07-03	1	27,539
Vito	van Helpen	Mann, Sauer and Sauer	350-730-6802	221 Jagged Harbor	Franklin borough	NY	80069	125,979	2016-07-18	1	18,897
Salvatore	van Egmond	Schmidt-Marks	530-818-9072	P.O. Box 51573	Berthold	SD	16229	111,804	2016-07-29	1	16,771
Jimmie	Mcclure	Braun, Crooks and Ortiz	837-318-3929	856 Forge Overpass	Annandale	NM	08463	159,194	2016-10-21	1	23,879
Leandro	van der Woerd	Mueller and Sons	770-152-0879	956 Lazy Grove	Ouray	MI	38713	212,181	2017-01-18	1	31,827
Marco	Lambrinou	Koss-Stamm	528-580-1960	250 Sunny Plaza	Urbancrest village	SC	21450	140,466	2017-03-10	1	21,070
Lottie	van Uden	Toy-Crona	758-340-1683	7 Elm Lane	Moro	NE	93832	177,886	2017-03-16	1	26,683
Jerold	Hooper	Muller, Lakin and Bogan	929-151-1240	843 Old Camp	New Holland village	WY	32125	130,140	2017-03-26	1	19,521
Gregg	Reyes	Pollich LLC	468-330-9105	403 Pleasant Park	Tonkawa	NC	85885	193,894	2017-03-29	1	29,084
Jame	Oosthuijzen	Graham, Towne and Monahan	616-169-8512	670 Lazy Cider	Glen Raven	NC	19967	139,493	2017-04-30	1	20,924
Devin	Otterspoor	Prohaska Inc	875-659-9072	325 Iron Bluff Heights	Walford	VT	11877	198,796	2017-05-16	1	29,819
Haywood	Huber	Braun, Crooks and Ortiz	671-452-9873	P.O. Box 30184	Wolfe	OK	08774	152,568	2017-05-31	1	22,885
Margrett	Cowan	Armstrong Group	866-169-7776	249 Old Passage	James village	ID	64602	174,882	2017-07-15	1	26,232
Adalberto	de Blanck	Tromp, Swift and Zulauf	470-616-9603	399 Hickory Boulevard	Hanahan	MN	25859	136,060	2017-07-30	1	20,409
Particia	Veenhof	Schmidt-Marks	804-107-4292	897 Amber Bluff	Huntley	IN	29911	152,088	2017-08-02	1	22,813
Filiberto	Kues	Schmidt-Marks	472-985-3826	370 Eighth Mews	Villano Beach	NV	52255	183,377	2017-09-07	1	27,507
Jonelle	Silva	Hansen-Herman	603-877-2995	891 Cinder Track	Denver borough	TN	06491	143,289	2017-09-11	1	21,493
Letisha	Benaerde	McCullough Inc	975-533-1423	685 Butterfly Orchard	Southlake	IL	99711	176,718	2017-10-05	1	26,508

a. You can't write this function using VLOOKUP currently because the data is not sorted alphabetically by First Name.

b. =VLOOKUP("B*****c?",Orders,9,FALSE)

c. =VLOOKUP("B?????c*",Orders,9,FALSE)

d. =VLOOKUP("B*****c?",Orders,9,TRUE)

e. =VLOOKUP("B?????c*",Orders,9,TRUE)

12. **Suppose that you have the following range of data, and you want to write a VLOOKUP function that finds the monthly sales based on the Month and Sales Rep ID you have entered in cells C14 and C15:**

Sales Rep ID	1/1/2020 Jan	2/1/2020 Feb	3/1/2020 Mar	4/1/2020 Apr	5/1/2020 May	6/1/2020 Jun	7/1/2020 Jul	8/1/2020 Aug	9/1/2020 Sep	10/1/2020 Oct	11/1/2020 Nov	12/1/2020 Dec
1	$ 159,182	$ -	$ 247,262	$ 156,746	$ 736,819	$ 251,239	$ 274,492	$ 466,263	$ -	$ 315,779	$ -	$ 996,112
2	230,254	432,621	-	461,898	359,130	480,945	564,314	640,183	620,017	469,879	183,436	741,526
3	1,135,702	1,274,247	763,525	441,812	1,338,174	1,157,015	961,599	-	671,428	458,556	951,167	268,581
4	-	-	223,495	-	-	225,320	225,869	196,953	-	176,651	-	241,825
5	384,465	272,842	284,841	-	1,087,529	923,381	455,437	908,646	501,294	177,761	559,874	378,116
6	226,509	189,041	554,264	280,018	218,101	213,913	216,848	211,090	205,635	286,721	172,011	191,361
7	162,928	551,062	254,536	652,300	276,197	440,263	400,173	173,662	193,652	1,080,958	275,727	349,371
8	225,276	635,752	252,118	452,591	332,075	286,017	216,818	684,726	516,123	234,131	-	-
9	464,931	-	537,280	165,772	226,537	-	-	699,899	-	247,267	469,094	276,065

Month: Jun
Sales Rep ID: 1

Sales:

You have named the entire data range from cell B3 through N12 "Table_2020". You attempt to write the following lookup function in cell C17:

=VLOOKUP(C15,Table_2020,HLOOKUP(C14,Table_2020,1,FALSE),FALSE)

Why does this function NOT work correctly, and how can you fix it?

a. HLOOKUP will not return the POSITION of the selected month, so you need to use MATCH to find it, or pass in the column position of the selected month in the table.

b. You entered "FALSE" when you should have entered "TRUE," or "1" as the last input to both these functions.

c. The "1" in the HLOOKUP function should be "0" because the first row of a table is always counted as the "zero row" in lookup functions.

d. You should not use the entire range, Table_2020, as an input parameter for VLOOKUP and HLOOKUP – it should be only the column or row you want to search.

13. **Now you want to write the same function as in the previous question, but you want to use INDEX and MATCH instead of the lookup functions. Which of the following answer choices is the correct formula?**

a. =INDEX(Table_2020, MATCH(C14,B3:N3,0), MATCH(C15,B3:B12,0))

b. =INDEX(Table_2020,MATCH(C15,B4:B12,0),MATCH(C14,C3:N3,0))

c. =INDEX(Table_2020,MATCH(C15,Table_2020,0),MATCH(C14,Table_2020,0))

d. =INDEX(Table_2020,MATCH(C15,B3:B12,0),MATCH(C14,B3:N3,0))

14. **In the lesson on INDEX, MATCH, and INDIRECT in the Excel course, we go through an example of how to use these functions to locate numbers in "messy" real estate data, where each real estate investment trust (REIT) reports its results in slightly different rows and columns. An excerpt of this file and an example formula are shown below:**

| SUM | ▼ | : | ✕ | ✓ | fx | =IFERROR(INDEX(INDIRECT($C11&$D$2&"!B2:M100"),MATCH($B11,INDIRECT($C11&$D$2&"!B2:B100"),0),MATCH(F$9,INDIRECT($C |

	A	B	C	D	E	F	G	H	I
1									
2		Data Spreadsheet Suffix:		_Data		Public Companies in the Set:	AVB	AvalonBay Communities, Inc.	
3							EQR	Equity Residential	
4							AIV	AIMCO	
5							CPT	Camden Property Trust	
6							ESS	Essex Property Trust, Inc.	
7							UDR	UDR, Inc.	
8									
9		Region:		REIT:	Apartment Homes	Q2 19 Rental Rate	Q2 18 Rental Rate	Q2 19 Rental Increase %	Q2 19 Occupancy	Q2 18 Occ
10		New England & Mid-Atlantic:							
11	=IFERROR(INDEX(INDIRECT($C11&$D$2&"!B2:M100"),MATCH($B11,INDIRECT($C11&$D$2&"!B2:							3.5%	95.4%
12	B100"),0),MATCH(F$9,INDIRECT($C11&$D$2&"!B2:M2"),0)),"")							3.3%	96.5%
13		Boston, MA		AIV	4,689		2,022	1,946	3.9%	96.9%
14		Boston, MA		CPT						
15		Boston, MA		ESS						
16		Boston, MA		UDR	1,388		2,926	2,806	4.3%	96.4%
17		Greater New York		AVB	3,533		3,245	3,126	3.8%	96.1%
18		Greater New York		EQR						

This formula above can be copied and pasted everywhere in the Summary sheet so that this single formula correctly retrieves the data for all the locations and all the REITs. The spreadsheets in this file have the following names:

| Summary | AVB_Data | EQR_Data | AIV_Data | CPT_Data | ESS_Data | UDR_Data |

Why is it necessary to write such a complex formula to retrieve the data from the individual spreadsheets (AVB_Data, EQR_Data, AIV_Data, etc.)? Consider ALL the components of this formula, including the INDIRECT part.

a. Because a single "Region" might be in a different row number in each REIT data sheet, so we must search for its position in its sheet using MATCH.

b. Because there are 6 spreadsheets with very similar names, so it is an ideal use case for the INDIRECT function – we can attach the text in the "REIT" column to "_Data" to create a text reference to each sheet.

c. Because we know the column names for the financial metrics, but we don't know the positions of these columns in the other 6 spreadsheets.

d. Because the filled data range is exactly B2:M100 in each spreadsheet – if the data range were different in each sheet, this formula would not work.

e. Because each REIT shown here owns properties in some of the same geographies – if there were no overlap, it wouldn't be possible to write such a function.

f. It's not necessary to do this – we could replicate this same functionality with a simple VLOOKUP since it's a relatively small file, with only 6 data sheets.

g. Answer choices 1, 2, 3, 4, and 5.

h. Answer choices 1, 2, and 3.

i. Answer choices 1, 3, 4, and 5.

j. Answer choices 2, 3, and 4.

15. **You've written a single formula that will scan quarterly data for a 4-unit property and roll up everything into a summary page using SUMIFS, INDIRECT, and MATCH. The quarterly data and the formula and summary page are shown below:**

Monthly Pro-Forma:	2015-04-30	2015-07-31	2015-10-31	2016-01-31	2016-04-30	2016-07-31	2016-10-31	2017-01-31	2017-04-30
Gross Potential Rent:									
Unit 1:	$ 37,500	$ 37,500	$ 37,500	$ 37,500	$ 37,500	$ 37,500	$ 53,550	$ 53,550	
Unit 2:	-	-	-	-	107,100	107,100	107,100	107,100	
Unit 3:	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	
Unit 4:	37,500	37,500	37,500	37,500	37,500	37,500	37,500	37,500	
(+) Gross Potential Rent:	125,000	125,000	125,000	125,000	232,100	232,100	248,150	248,150	
Turnover Vacancy:									
Unit 1:	-	-	-	-	-	-	(53,550)	(53,550)	
Unit 2:	-	-	-	-	(107,100)	(107,100)	-	-	
Unit 3:	-	-	-	-	-	-	-	-	
Unit 4:	-	-	-	-	-	-	-	-	
(-) Turnover Vacancy:	-	-	-	-	(107,100)	(107,100)	(53,550)	(53,550)	
Free Months of Rent:									
Unit 1:	-	-	-	-	-	-	-	-	
Unit 2:	-	-	-	-	-	-	(107,100)	(107,100)	
Unit 3:	-	-	-	-	-	-	-	-	
Unit 4:	-	-	-	-	-	-	-	-	
(-) Free Months of Rent:	-	-	-	-	-	-	(107,100)	(107,100)	
Property Taxes:									
Unit 1:	-	-	-	-	-	-	(10,625)	(10,625)	
Unit 2:	(21,250)	(21,250)	(21,250)	(21,250)	(21,250)	(21,250)	-	-	
Unit 3:	-	-	-	-	-	-	-	-	
Unit 4:	-	-	-	-	-	-	-	-	
(-) Property Taxes:	(21,250)	(21,250)	(21,250)	(21,250)	(21,250)	(21,250)	(10,625)	(10,625)	

	A	B	C	D	E	F	G	H	I	J	K	L
1												
2		Annual Pro-Forma:			2015-04-30	2016-04-30	2017-04-30	2018-04-30	2019-04-30			
3												
4		(+) Gross Potential Rent:			=SUMIFS(INDIRECT("Quarters!E"&MATCH($B4,Quarters!$B$1:$B$51,0)&":$T$"&							
5		(-) Turnover Vacancy:			MATCH($B4,Quarters!$B$1:$B$51,0)),Quarters!$E$2:$T$2,"<="&Summary!E$2,							
6		(-) Free Months of Rent:			Quarters!$E$2:$T$2,">"&Summary!D$2)							
7		Effective Gross Income:			500,000	425,000	564,200	992,600				
8												
9		(-) Property Taxes:			(85,000)	(63,750)	-	-				
10		(-) Insurance & Utilities:			(120,000)	(90,000)	-	-				
11		Operating Expenses:			(205,000)	(153,750)	-	-				
12												
13		Net Operating Income (NOI):			295,000	271,250	564,200	992,600				
14												
15		(-) Capital Expenditures:			-	(1,125,000)	-	-				
16		(-) TIs & LCs:			-	(428,400)	(214,200)	-				
17		Capital Costs:			-	(1,553,400)	(214,200)	-				
18												
19		Adjusted NOI:			295,000	(1,282,150)	350,000	992,600				

Is it possible to simplify this formula to make it easier to read and understand without reducing its flexibility?

a. You could eliminate the SUMIFS function by always summing up 4 quarters' worth of data but shifting the starting and ending positions in each column; you might do this with a helper row above that lists each year's starting position.

b. If you enter the row number for each line item on the Quarters spreadsheet in a helper column, you could eliminate the MATCH functions and use these hard-coded row numbers.

c. You could potentially eliminate the INDIRECT function by using OFFSET along with a helper row and column to get the correct starting positions for the sums.

d. All of the above would work to simplify the formula, with few disadvantages.

e. Not really – you could implement these methods to simplify the formula, but they would also introduce other problems and create the need to update helper rows and columns.

16. You are writing a MINIF function that determines the minimum dollar order placed within a certain date range. Excel does have a built-in MINIFS function, but you want to write your own version to practice. Your function is shown in the screenshot below (note that this is an array function, entered with Ctrl + Shift + Enter):

	A	B	C	D	E	F	G	H	I
1									
2		Summary and Analysis of Due Diligence Data - Customer Orders							
3									
4		Sales Data and Statistics by Year:							
5			Total	Average	Total # of	Total	Minimum	Maximum	
6		Year:	Sales:	Order Size:	Orders:	Commissions:	Order:	Order:	
7		2016	$ 969,030	$ 138,433	7	$ 145,355	=MIN(IF((Orders!$K$3:$K$1000>=Summary!$B7)*		
8		2017	2,965,850	164,769	18	444,878	(Orders!$K$3:$K$1000<Summary!B8)>0,		
9		2018	6,211,826	200,381	31	854,654	Orders!$J$3:$J$1000,""))		
10		2019	12,074,872	232,209	52	1,626,392	179,026	294,208	
11		2020	22,000,859	275,011	80	2,878,891	200,199	349,898	
12		2021	33,973,085	311,680	109	4,351,913	232,239	399,753	
13		2022	42,930,202	343,442	125	5,056,366	250,174	448,996	
14		2023	61,048,714	388,845	157	6,906,900	300,835	499,546	
15		2024	90,993,446	497,232	183	9,854,571	400,117	596,090	
16		2025	135,147,098	570,511	236	14,472,759	450,506	698,189	
17		2026							

Column K in the "Orders" spreadsheet contains all the dates for the orders, and column J contains the dollar amounts. Which of the following answer choices best describe(s) what's required – or not required – for this array function to work correctly?

a. The double quotes ("") at the end are NOT necessary – using a "0" there would have the same effect since Excel assigns the same internal values to "0" and "" in a formula.

b. It is NOT necessary to anchor the data ranges in the Orders worksheet – writing Orders!K3:K1001, for example, would have the same effect as writing Orders!$K$3:$K$1001 since this is an array function.

c. Pressing Ctrl + Shift + Enter at the end to make it an array function is NOT required if you're entering the formula in a single cell – you only need to do that when entering the formula across multiple cells.

d. You do NOT need to multiply the two inner logical checks within the IF to produce a 1 or 0 – you could use the AND operator instead.

e. It is NOT possible to copy and paste this function down because by default, array functions do not shift around the row and column components of cell references.

f. If this formula is entered on the "Summary" spreadsheet, you could remove the Summary! parts in front of the B7 and B8 cell references.

g. Answer choices 1, 3, 4, and 5.

h. Answer choices 1, 3, 5, and 6.

i. Answer choices 2, 5, and 6.

j. Answer choices 2, 3, 4, and 6.

17. You are creating a CapEx and Depreciation schedule using the OFFSET function. The formula you're writing will check the current year number, and if there's Depreciation associated with the CapEx in that year, it will multiply the CapEx by the appropriate Depreciation percentage.

For example, the Year 1 Depreciation percentage is 20%, so the 2022 Depreciation percentage of 2022 CapEx should be 20%. The 2025 Depreciation percentage of 2025 CapEx should be 20%.

But the Year 2 Depreciation percentage is 32%, so the 2023 Depreciation percentage of 2023 CapEx should be 32%, and the 2026 Depreciation percentage of 2025 CapEx should be 32%.

Will the formula shown below calculate the Depreciation dollar amounts correctly?

N O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
48												
49		Year:	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
50		Year #:	1	2	3	4	5	6	7	8	9	10
51		% Allocation:	20.0%	32.0%	19.2%	11.5%	11.5%	5.8%	–	–	–	–
52	Year:	CapEx:										
53	2019	$ 1,000										
54	2020	1,050	=IF(T$49>=$P54,OFFSET($Q$51,0,($P54-$P$53))*$Q54,0)									
55	2021	1,150										
56	2022	1,200										
57	2023	1,300										
58	2024	1,350										
59	2025	1,400										
60	2026	1,500										
61	2027	1,550										
62	2028	1,600										

a. Yes – the formula uses OFFSET to do what is described here.

b. No – the T$49>= $P54 part should use > rather than >=.

c. No – the order of inputs for the OFFSET function is reversed, so the ($P54 – $P$53) part should come first, followed by the 0.

d. No – the ($P54 – $P$53) part will not calculate the relative year number correctly, so it should be T$50 – ($P54 – $P$53) instead.

18. You're building error checks into the calculations for a set of comparable public companies. The formula you're using to calculate the valuation multiples is shown below (G60 represents Enterprise Value, and G6 represents LTM Revenue):

	A	B	C	D	E	F	G	H
58								
59		Equity Value:					$ 112,121	
60		Enterprise Value:					110,817	
61		Levered Beta:					0.90	
62								
63				Valuation Multiples:				
64				LTM	2020-01-31	2021-01-31	2022-01-31	
65		EV / Revenue:		=IFERROR(IF(OR(+G$60/G6<0,+G$60/G6>=100),"NM",+G$60/G6), "N/A")				
66		EV / EBITDA:		18.0 x	16.9 x	15.7 x N/A		
67		P / E:		31.1 x	30.9 x	29.3 x N/A		
68								

Is the IFERROR function on the outside of this formula necessary, or could you replace it with other functions to check for errors, such as ISNA and ISNUMBER?

    a. You could potentially rewrite this formula using several IF statements and other functions, but it would be longer and more difficult to interpret.

    b. The IFERROR function is required because no other function can detect a "Divide by 0" error.

    c. The IFERROR function is required because of the inner part of the formula; the other error-checking functions do not support that type of logic.

    d. You could rewrite this formula using other functions, but you would also have to rewrite the inner part that checks if the valuation multiple is below 0 or greater than or equal to 100.

19. **You're creating a sensitivity table in a DCF analysis, and in the top row and leftmost column of the table, you've linked directly to the Discount Rate and Terminal FCF Growth Rate assumptions in the model, as shown below.**

    The rest of the cells in the top row and leftmost column are then calculated based on additions or subtractions to these numbers. Why will this table not work correctly?

Sensitivity - Terminal FCF Growth Rate vs. Discount Rate and Implied Share Price from DCF Analysis:

	Terminal FCF Growth Rate:										
		(0.68%)	(0.55%)	(0.43%)	(0.30%)	(0.18%)	(0.05%)	0.08%	0.20%	0.33%	0.45%	0.58%
Discount Rate (WACC):	6.04%										
	5.79%										
	5.54%										
	5.29%										
	=Discount_Rate										
	4.79%										
	4.54%										
	4.29%										
	4.04%										

    a. Because in a sensitivity table, *everything* in the top row and leftmost column – not just these two single cells – must be linked directly to the model assumptions.

b. Because nothing in the table can be linked to the assumptions in the model – each number in the top row and leftmost column should be a hard-coded constant or calculated based on a hard-coded constant in this area.

c. Because these direct links are in the middle of the top row and leftmost column; to work properly, they must be at the beginning or end.

d. The question premise is false – this specific setup should not create any problems in the table.

20. **You have finished building a leveraged buyout (LBO) model with support for interest calculations based on the beginning Debt balances or the average Debt balances. You want to use the Solver Add-In to determine the purchase premium required to achieve a 25% IRR, with the constraint that the purchase premium must be 0 or positive.**

    Your setup for the Solver Parameters is shown below (assume that cell M8 contains the purchase premium assumption):

I320 =IRR(I317:N317)

	C	D	E	F	G	H	I	J	K	L	M	N	O P	Q	R	S
285	(EBITDA - CapEx) / Net Interest Expense:			x				5.9 x	16.9 x	41.8 x	189.5 x	(95.1 x)				
286	(EBITDA - CapEx +/- Change in WC) / Net Intere			x				7.6 x	18.8 x	45.9 x	202.0 x	(101.6 x)				
287																
288	Total Debt / Equity:			x				0.1 x	0.0 x	0.0 x	0.0 x	0.0 x				
289	Total Debt / Capital:			%				10.0%	4.2%	3.9%	3.6%	3.4%				
290	Net Debt / Equity:			x				0.1 x	(0.0 x)	(0.1 x)	(0.2 x)	(0.3 x)				
291	Net Debt / Net Capital:			%				7.4%	(0.0%)	(10.6%)	(24.1%)	(42.7%)				
292																
293	Debt Service Coverage Ratio:			x												

Free Cash Flow Conversion Analysis / Investor Returns table:

	C	F	G	H	I
294					
295	Cumulative Debt Paydown:	¥ M			
296	Cumulative Debt Paydown % of Initial Debt:	%			
297					
298	**Free Cash Flow Conversion Analysis:**				
299	EBITDA:	¥ M	¥ 334.8	¥ 396.5	¥ 563.8
300	Less: CapEx:	¥ M	(425.6)	(566.8)	(546.2)
301	Less: Net Interest Expense:	¥ M	1.0	(1.0)	(13.6)
302	Less: Taxes:	¥ M	(35.8)	(36.3)	(67.5)
303	Plus: Stock-Based Compensation:	¥ M	15.5	43.5	27.1
304	Plus/Less: Other Non-Cash Items:	¥ M	(1.8)	(3.7)	(7.1)
305	Plus/Less: Change in WC:	¥ M	21.6	58.2	69.8
306	**Free Cash Flow:**	¥ M	¥ -90.4	¥ -109.5	¥ 26.3
307	FCF Conversion %:	%	(27.0%)	(27.6%)	4.7%
308	FCF Yield %:	%			

	C	Units	FY10	FY11	FY12
310				**Historical**	
311	**Investor Returns:**	Units	FY10	FY11	FY12
312					
313	EBITDA:	¥ M			¥ 563.8
314	EBITDA Multiple:	x			7.4 x
315	Enterprise Value:	¥ M			4,159.8
316	Equity Value:	¥ M			4,313.5
317	Investor Equity:	¥ M			(1,856.5)
318					
319	**Money-on-Money (MoM) Multiple:**	x			2.4 x
320	**Internal Rate of Return (IRR):**	%			19.6%

Solver Parameters ☒

Set Objective: $I$320

To: ○ Max   ○ Min   ◉ Value Of: .25

By Changing Variable Cells: $M$8

Subject to the Constraints:
$M$8 >= 0

[Add] [Change] [Delete] [Reset All] [Load/Save]

☑ Make Unconstrained Variables Non-Negative

Select a Solving Method: GRG Nonlinear   [Options]

Solving Method
Select the GRG Nonlinear engine for Solver Problems that are smooth nonlinear. Select the LP Simplex engine for linear Solver Problems, and select the Evolutionary engine for Solver problems that are non-smooth.

[Help]   [Solve]   [Close]

Sheet tab: **7-Days-LBO**

Point   Calculate

Using ONLY this screenshot and the description above, how can you tell that Solver may not work correctly in this case?

a. You're setting the IRR to a specific value rather than using the Min or Max settings.

b. You also need to add constraints for the other assumptions and drivers in the model.

c. There's a circular reference for the interest calculations in the model, indicated by the "Calculate" at the bottom of the screen.

d. None of the above – there shouldn't be any problems or potential problems with Solver in this model.