Spreadsheet Software

Terry Marris August 2009

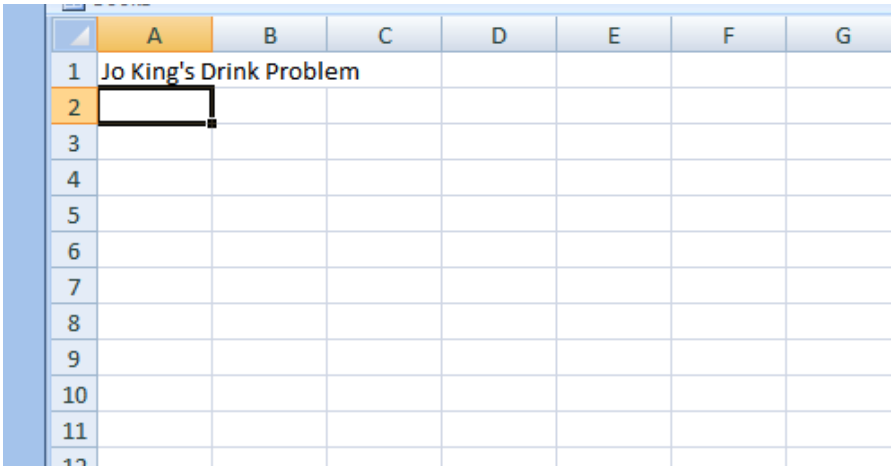
3 Arithmetic

Previously, we summed a column of numbers, formatted headings, captions and columns, and printed formulae. Now, we look at:

- using autofill to complete a sequence
- using the familiar arithmetic operators, +, -, x, and /
- copying and pasting
- formatting cells as currency
- comments

Our friend, Jo King, has a drinks problem We estimate how much his problem costs in a year. We start a new spreadsheet.

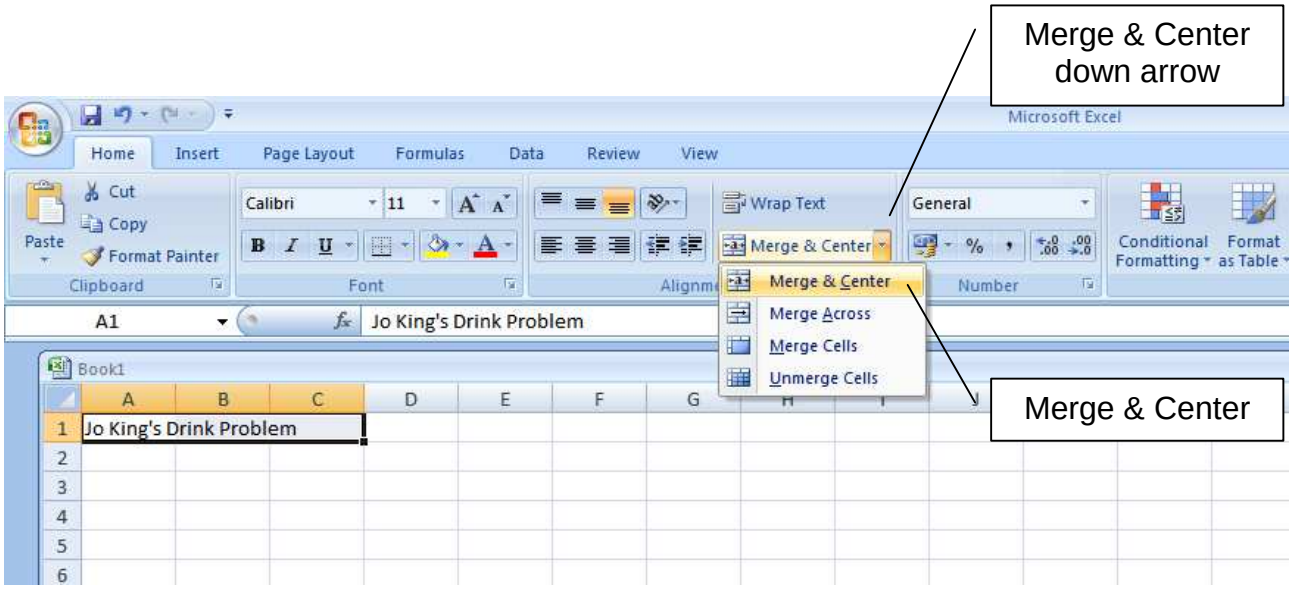
- in A1 enter Jo Kings Drink Problem

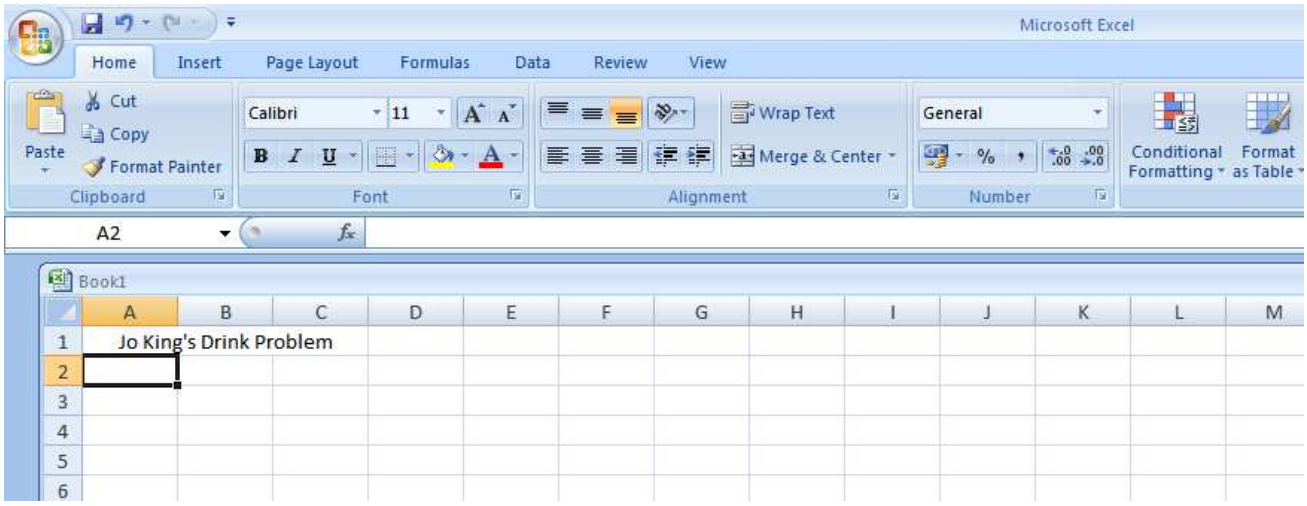


3.1 Merge Cells

We see that the title, Jo King's Drink Problem, spans three columns. We do not want to make column A wider. So we merge the three cells occupied by the title.

1. highlight the cells A1, B1, C1 altogether
2. on Alignment Panel click Merge & Center down arrow
3. choose Merge & Center

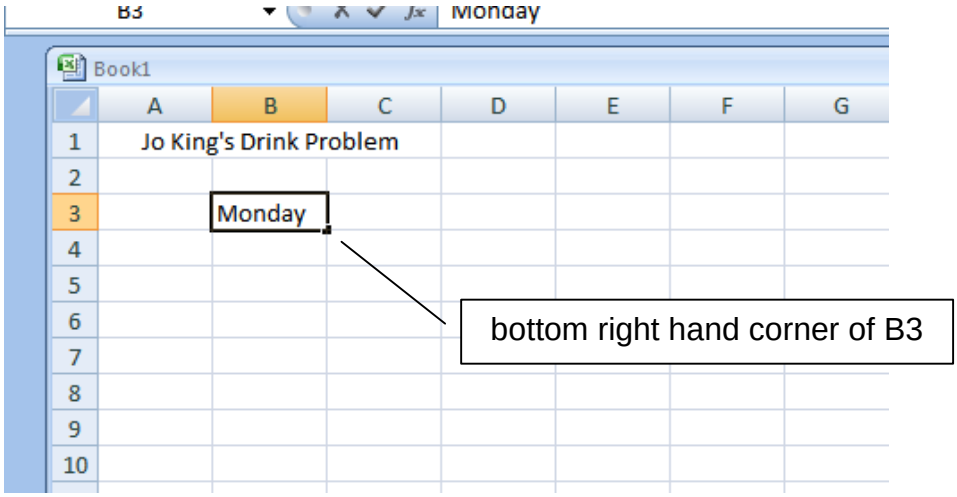




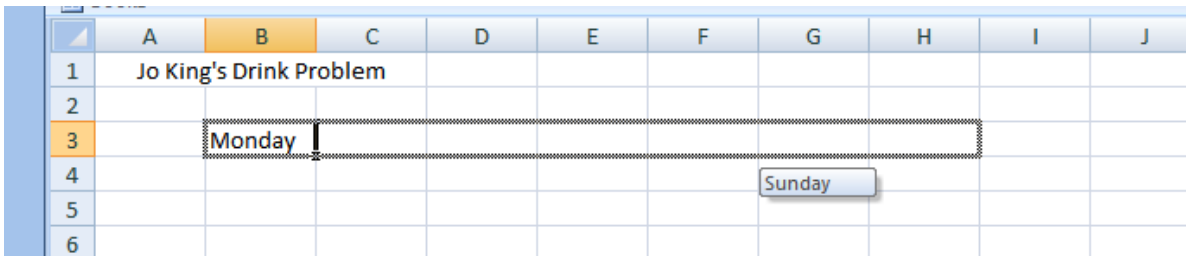
3.2 Use Autofill

We use Autofill to complete the days of the week, Monday..Sunday.

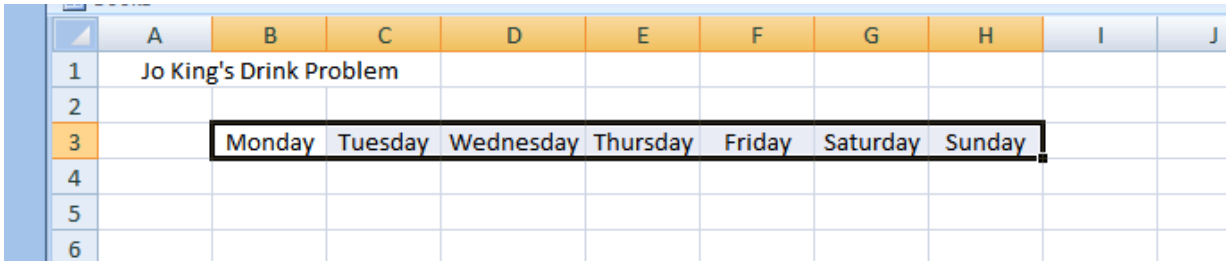
1. enter Monday in B3



2. position cursor on bottom right hand corner of cell B3. The cursor changes to a cross
3. hold mouse button down
4. drag to H3



5. centre the days headings and widen columns as necessary to accommodate



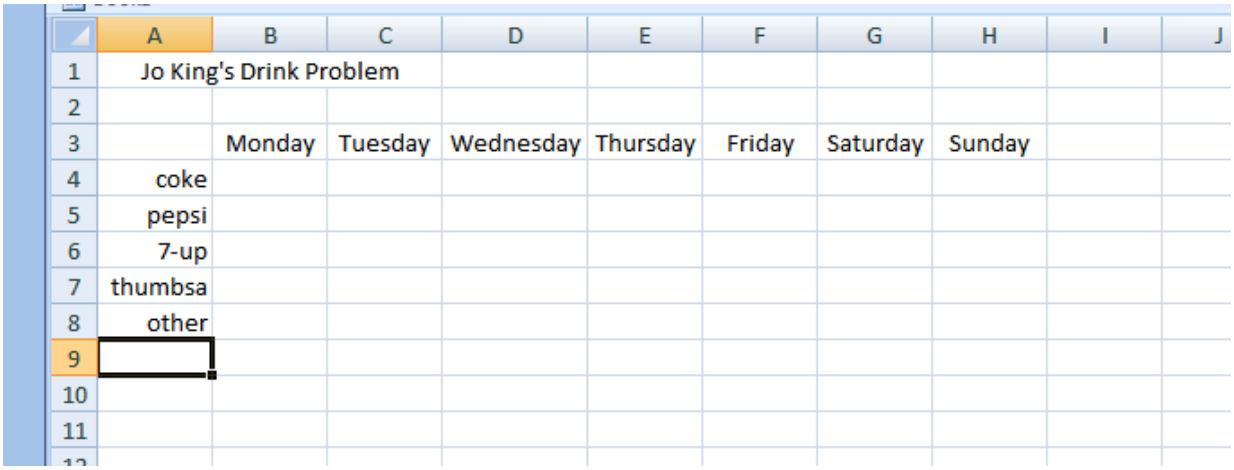
The days from Monday up to Sunday inclusive have been automatically entered. You can use always autofill to complete a continuous sequence such as days of the week, months and numbers.

3.3 Enter Captions and Data

We enter the number of drinks bought by Jo each for day of the week.

Captions for drinks. Enter:

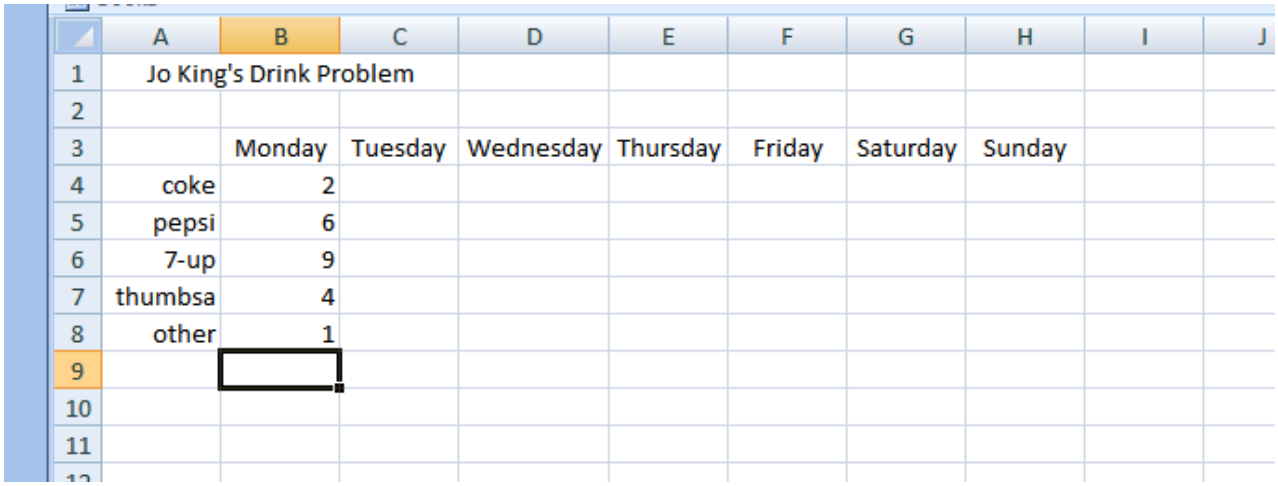
1. coke in A4
2. pepsi in A5
3. 7-Up in A6
4. thumbsa in A7 and
5. other in A8
6. right justify the captions



	A	B	C	D	E	F	G	H	I	J
1	Jo King's Drink Problem									
2										
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
4	coke									
5	pepsi									
6	7-up									
7	thumbsa									
8	other									
9										
10										
11										

Numbers for Monday. Enter:

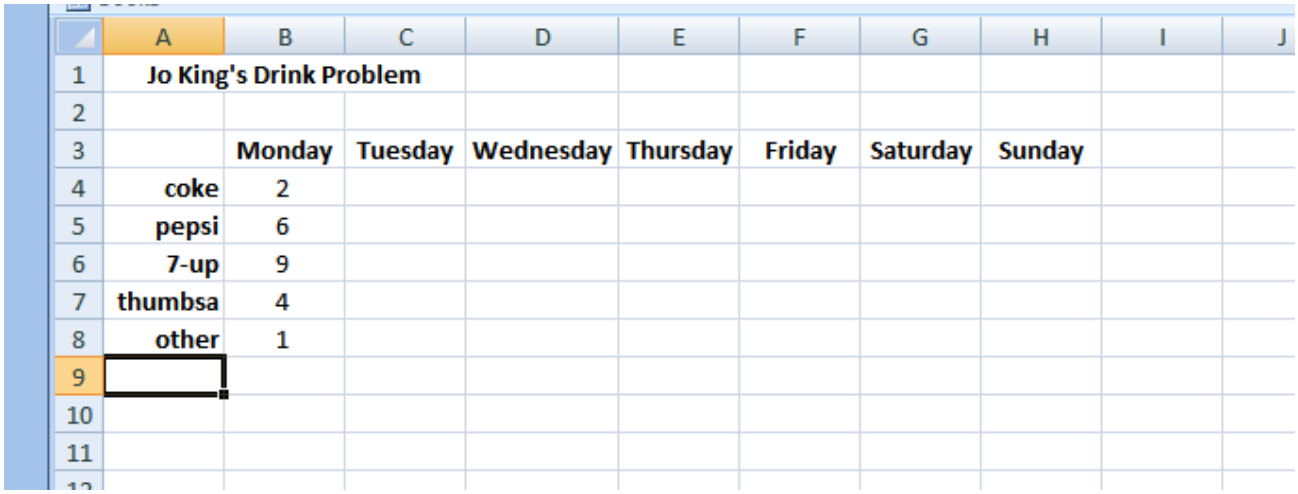
1. 2 in B4
2. 6 in B5
3. 9 in B6
4. 4 in B7
5. 1 in B8



	A	B	C	D	E	F	G	H	I	J
1	Jo King's Drink Problem									
2										
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
4	coke	2								
5	pepsi	6								
6	7-up	9								
7	thumbsa	4								
8	other	1								
9										
10										
11										

Apply some formatting

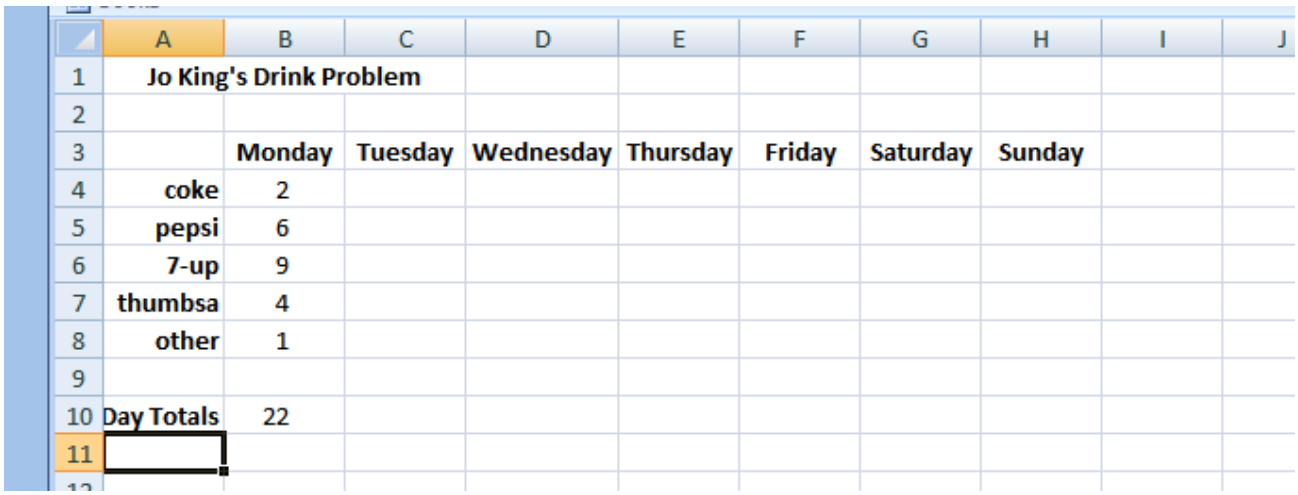
1. embolden headings and captions
2. centre and right justify Mondays numbers



	A	B	C	D	E	F	G	H	I	J
1	**Jo King's Drink Problem**									
2										
3		**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**		
4	**coke**	2								
5	**pepsi**	6								
6	**7-up**	9								
7	**thumbsa**	4								
8	**other**	1								
9										
10										
11										

Caption for Day Totals

1. enter *Day Totals* in A10, and embolden it
2. enter the formula to create Monday's total in B10. Check that the answer is correct.
3. align Monday's total with the numbers in its column



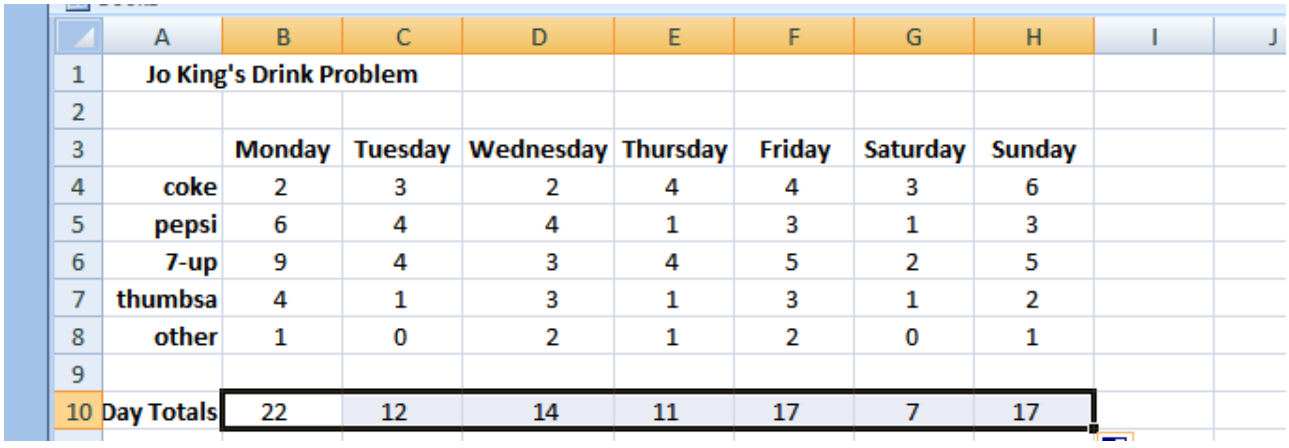
	A	B	C	D	E	F	G	H	I	J
1	Jo King's Drink Problem									
2										
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
4	coke	2								
5	pepsi	6								
6	7-up	9								
7	thumbsa	4								
8	other	1								
9										
10	Day Totals	22								
11										

Complete the numbers for the rest of the week. Enter:

for Tuesday: 3, 4, 4, 1, 0
for Wednesday: 2, 4, 3, 3, 2
for Thursday: 4, 1, 4, 1, 1
for Friday 4, 3, 5, 3, 2
for Saturday: 3, 1, 2, 1, 0
for Sunday: 6, 3, 5, 2, 1

Use Autofill to complete the rest of the day totals

1. Position mouse pointer in bottom right hand corner of B10. Cursor changes to a cross
2. Hold left hand button down and drag to H10



	A	B	C	D	E	F	G	H	I	J
1	Jo King's Drink Problem									
2										
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
4	coke	2	3	2	4	4	3	6		
5	pepsi	6	4	4	1	3	1	3		
6	7-up	9	4	3	4	5	2	5		
7	thumbsa	4	1	3	1	3	1	2		
8	other	1	0	2	1	2	0	1		
9										
10	Day Totals	22	12	14	11	17	7	17		

3. check that all your Day Totals are correct
4. check out the Day Total formula for each day. (Click on B10, C10, D10, ... H10 in turn.) What do you notice? Isn't Autofill clever?
5. ensure all your numbers are central under their headings and right justified

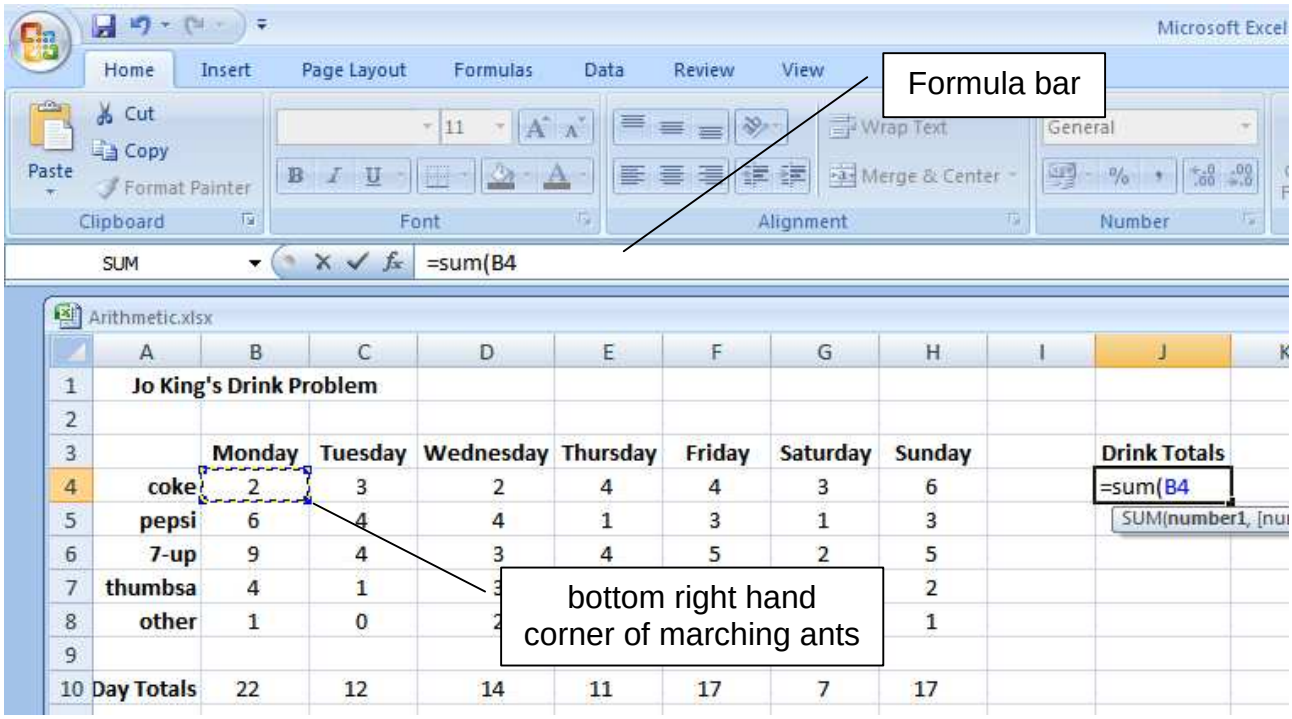
3.4 Sum a Row

We have seen how to use the SUM function to add up a column of numbers. Now we see how to use the SUM function to add up a row of numbers.

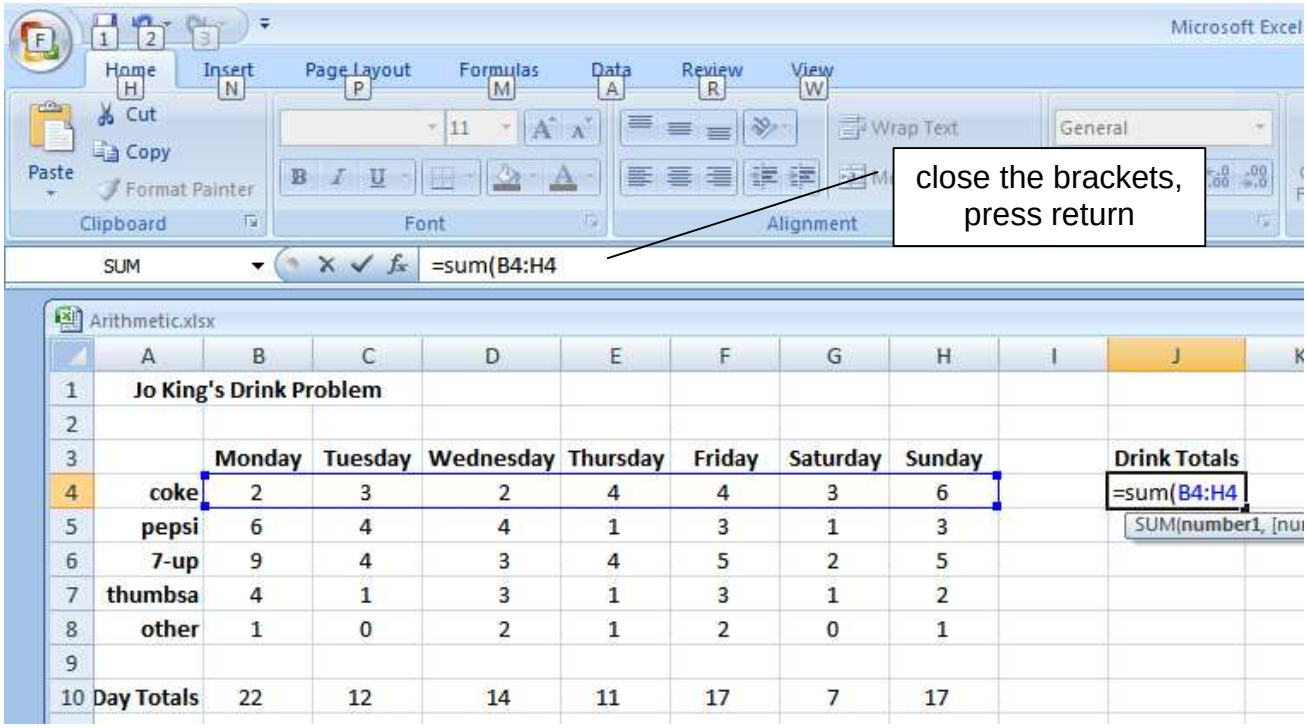
1. in J3 enter the heading *Drinks Totals*. Embolden the heading, widen the column to accommodate the text and centre it.

	A	B	C	D	E	F	G	H	I	J
1	Jo King's Drink Problem									
2										
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		Drink Totals
4	coke	2	3	2	4	4	3	6		
5	pepsi	6	4	4	1	3	1	3		
6	7-up	9	4	3	4	5	2	5		
7	thumbsa	4	1	3	1	3	1	2		
8	other	1	0	2	1	2	0	1		
9										
10	Day Totals	22	12	14	11	17	7	17		

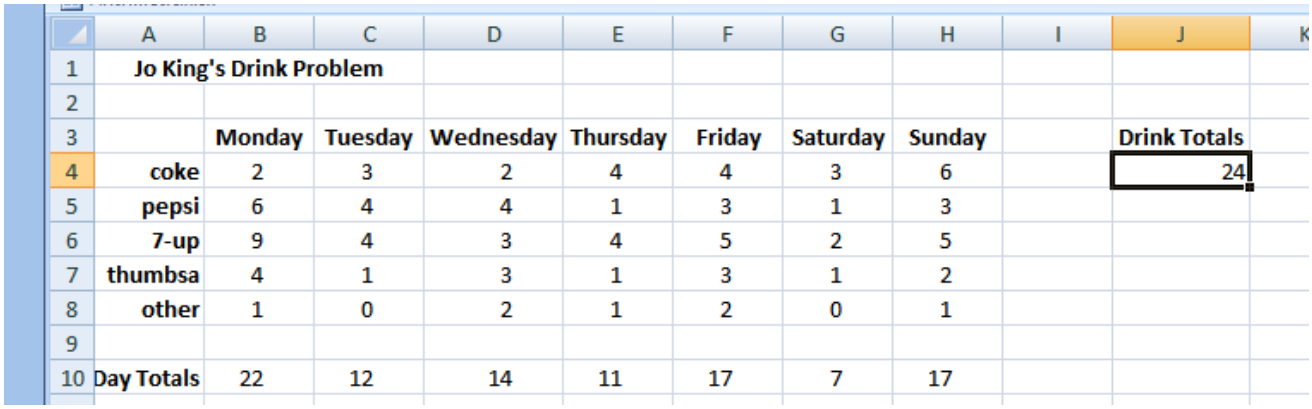
2. click in J4 to make it active
3. in the formula bar enter =Sum(
4. click B4



5. place cursor on bottom right corner of marching ants, cursor changes to a diagonal two-headed arrow
6. hold left mouse button down, drag to H4



7. complete the formula by closing the brackets and pressing return



8. check that your answer to coke's total is correct

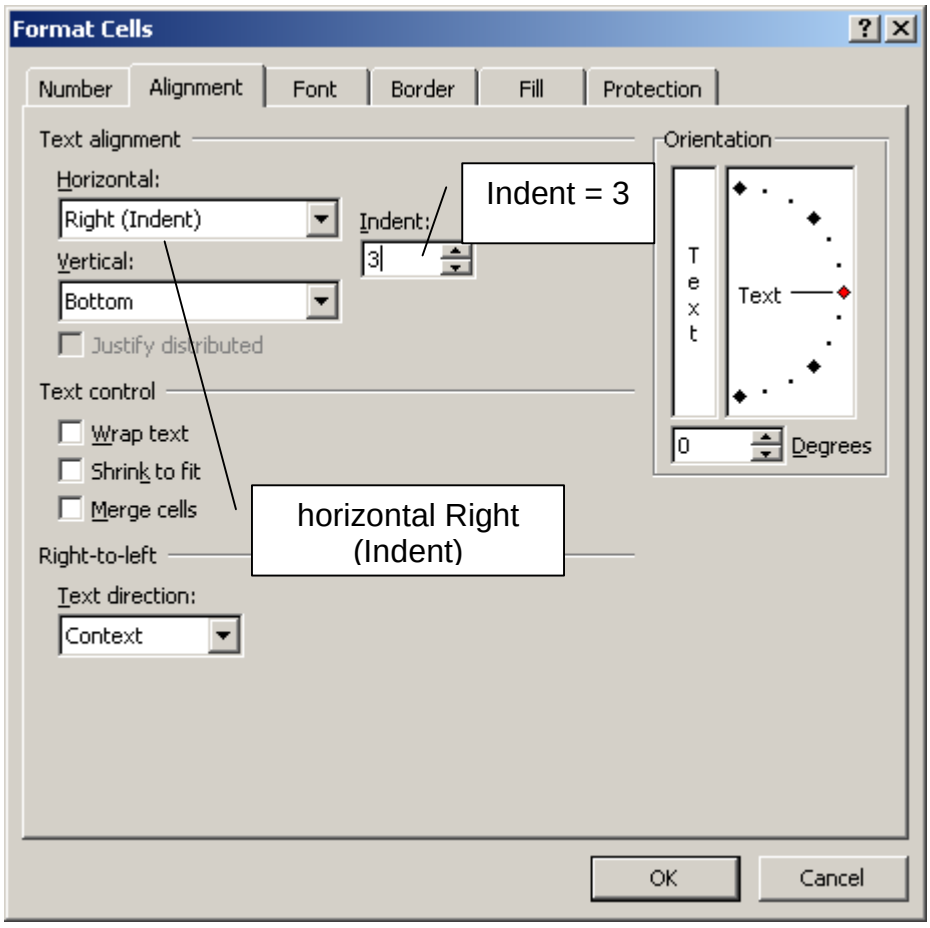
Now we use autofill to complete the Drink Totals column.

1. Click J4
2. Move pointer to bottom right of J4. Cursor changes to a black cross
3. Hold left button down, drag to J8

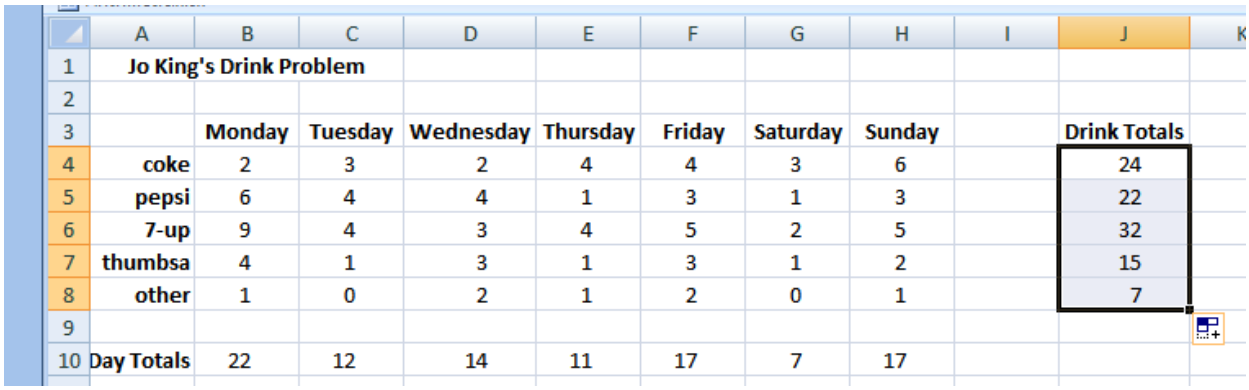
	A	B	C	D	E	F	G	H	I	J
1	Jo King's Drink Problem									
2										
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		Drink Totals
4	coke	2	3	2	4	4	3	6		24
5	pepsi	6	4	4	1	3	1	3		22
6	7-up	9	4	3	4	5	2	5		32
7	thumbsa	4	1	3	1	3	1	2		15
8	other	1	0	2	1	2	0	1		7
9										
10	Day Totals	22	12	14	11	17	7	17		

Then we format the column

1. select Alignment Panel down arrow (known as the launcher)



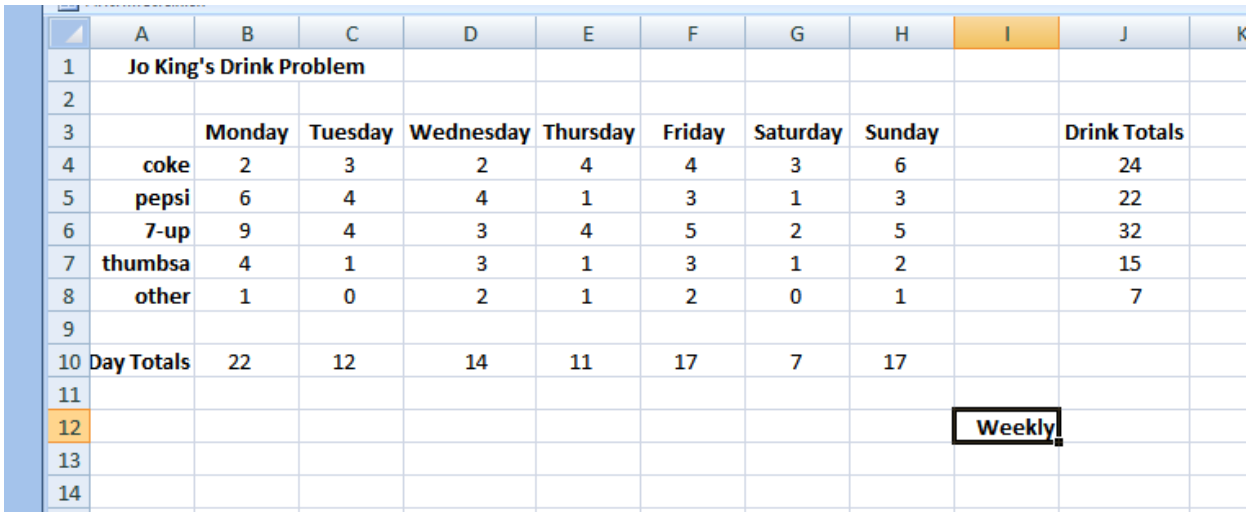
2. set Horizontal Right (Indent)
3. indent = 3
4. OK



	A	B	C	D	E	F	G	H	I	J	K
1	Jo King's Drink Problem										
2											
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		Drink Totals	
4	coke	2	3	2	4	4	3	6		24	
5	pepsi	6	4	4	1	3	1	3		22	
6	7-up	9	4	3	4	5	2	5		32	
7	thumbsa	4	1	3	1	3	1	2		15	
8	other	1	0	2	1	2	0	1		7	
9											
10	Day Totals	22	12	14	11	17	7	17			

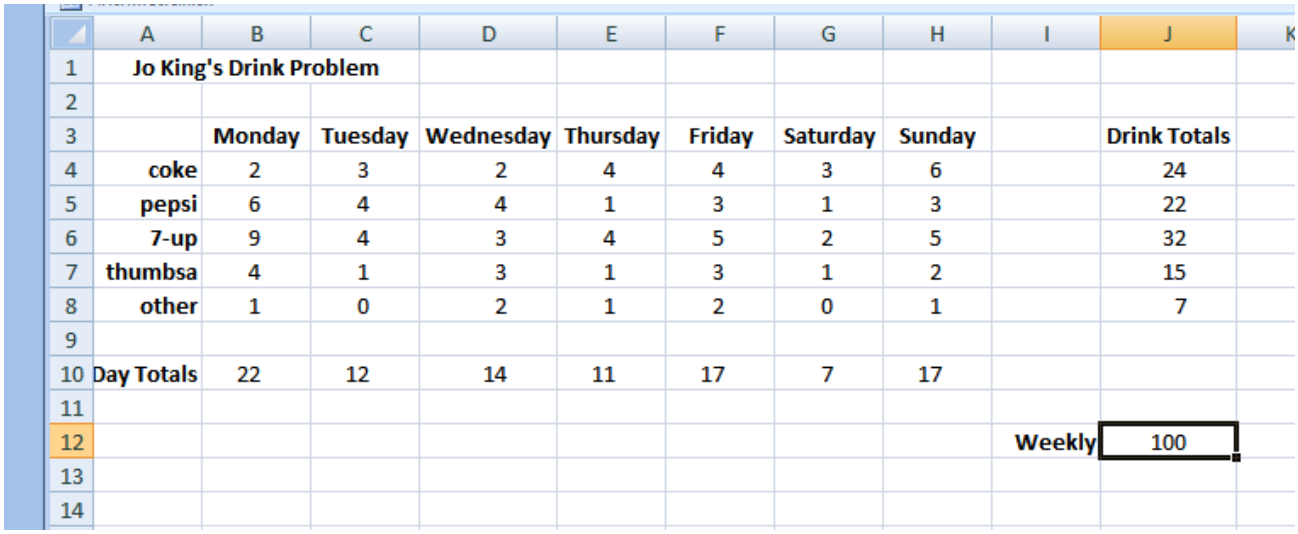
Now we want the grand total of drinks for the week. We could either add up the Drink totals column, or add up the Day Totals row. Both will give us the same answer.

1. in I12 put the caption *Weekly*, emboldend and right justified



	A	B	C	D	E	F	G	H	I	J	K
1	Jo King's Drink Problem										
2											
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		Drink Totals	
4	coke	2	3	2	4	4	3	6		24	
5	pepsi	6	4	4	1	3	1	3		22	
6	7-up	9	4	3	4	5	2	5		32	
7	thumbsa	4	1	3	1	3	1	2		15	
8	other	1	0	2	1	2	0	1		7	
9											
10	Day Totals	22	12	14	11	17	7	17			
11											
12									Weekly		
13											
14											

2. in J12 we enter a formula for the weekly total, and align the answer with the numbers in its column



	A	B	C	D	E	F	G	H	I	J
1	Jo King's Drink Problem									
2										
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		Drink Totals
4	coke	2	3	2	4	4	3	6		24
5	pepsi	6	4	4	1	3	1	3		22
6	7-up	9	4	3	4	5	2	5		32
7	thumbsa	4	1	3	1	3	1	2		15
8	other	1	0	2	1	2	0	1		7
9										
10	Day Totals	22	12	14	11	17	7	17		
11										
12									Weekly	100
13										
14										

3. check that your answer is correct by mentally adding up the Drink Totals column

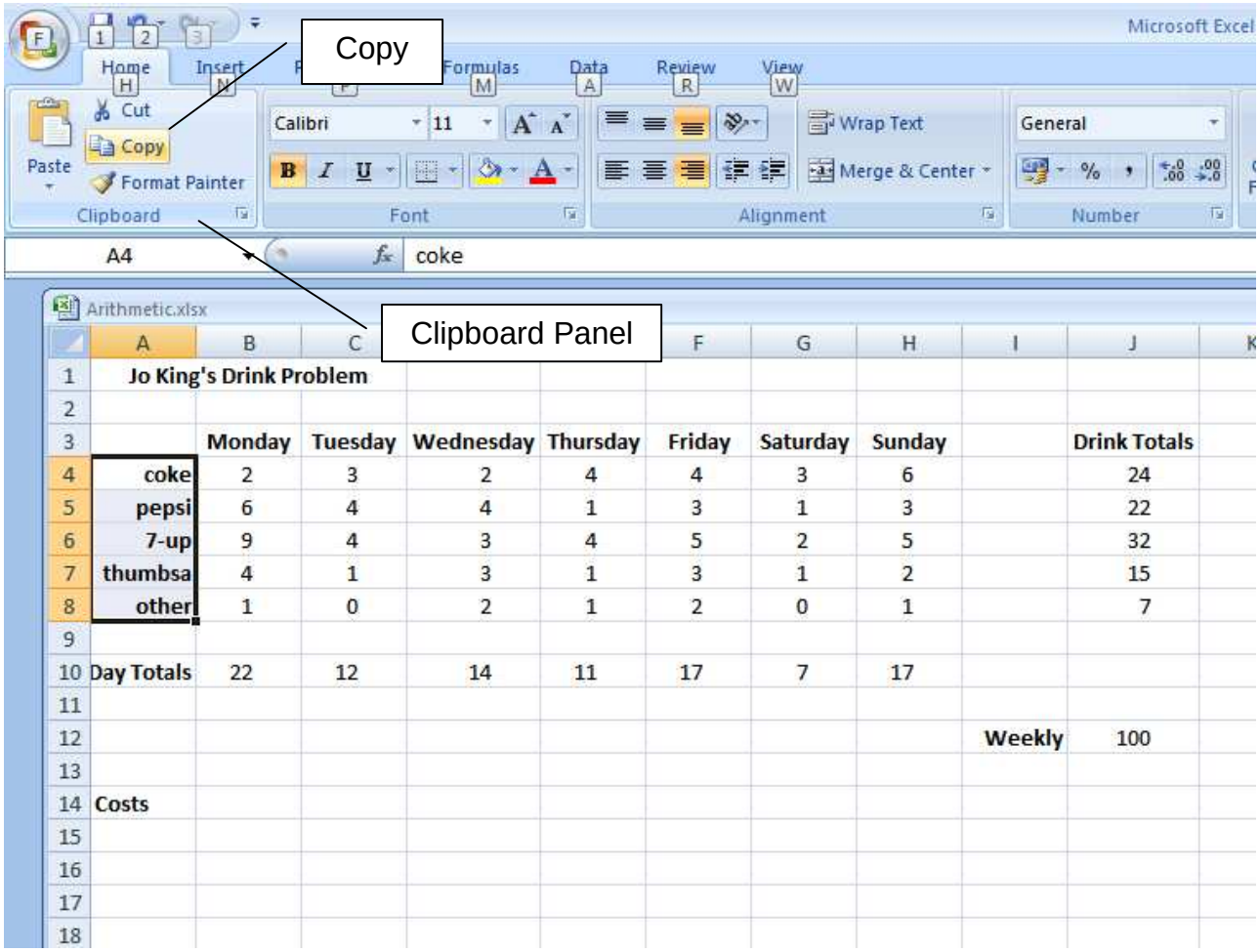
3.5 Copy and Paste

We work out the cost of the drinking habit. First, we create some headings:

1. put the heading Costs in A14 and embolden

We copy the names of the drinks from A4..A8 to A16..A20.

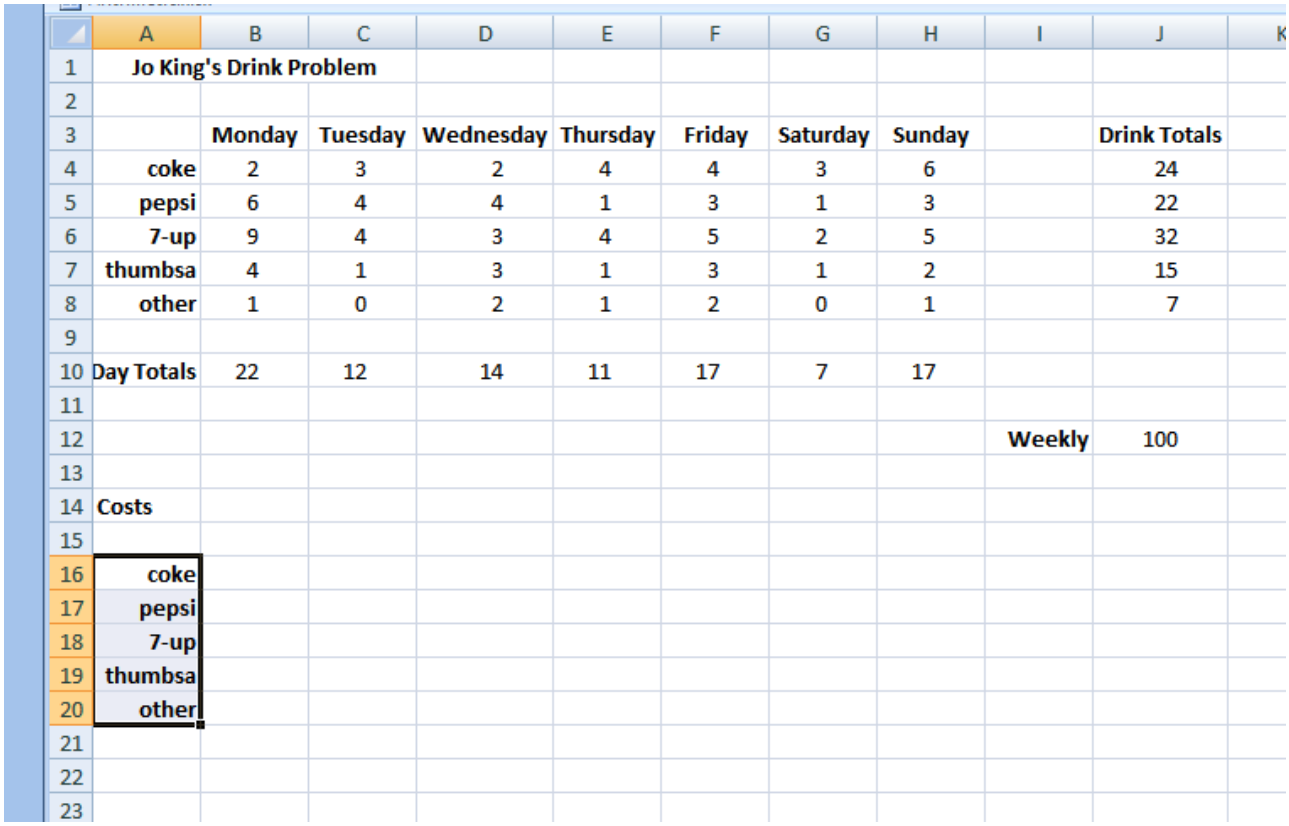
2. Highlight the cells we want to copy: A4..A8
3. On the Clipboard Panel select Copy



	A	B	C	D	E	F	G	H	I	J
1	Jo King's Drink Problem									
2										
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		Drink Totals
4	coke	2	3	2	4	4	3	6		24
5	pepsi	6	4	4	1	3	1	3		22
6	7-up	9	4	3	4	5	2	5		32
7	thumbsa	4	1	3	1	3	1	2		15
8	other	1	0	2	1	2	0	1		7
9										
10	Day Totals	22	12	14	11	17	7	17		
11										
12									Weekly	100
13										
14	Costs									
15										
16										
17										
18										

See the marching ants around the selected cells

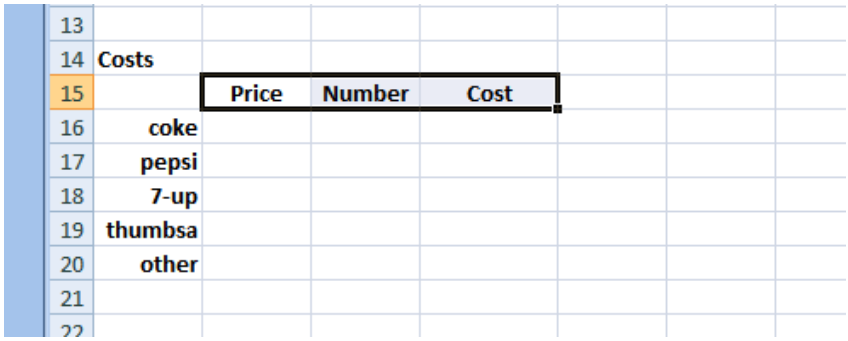
4. Click A16 to confirm where to copy to
5. Press Return to complete



	A	B	C	D	E	F	G	H	I	J
1	Jo King's Drink Problem									
2										
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		Drink Totals
4	coke	2	3	2	4	4	3	6		24
5	pepsi	6	4	4	1	3	1	3		22
6	7-up	9	4	3	4	5	2	5		32
7	thumbsa	4	1	3	1	3	1	2		15
8	other	1	0	2	1	2	0	1		7
9										
10	Day Totals	22	12	14	11	17	7	17		
11										
12									Weekly	100
13										
14	Costs									
15										
16	coke									
17	pepsi									
18	7-up									
19	thumbsa									
20	other									
21										
22										
23										

We add some headings:

1. *Price* in B15
2. *Number* in C15
3. *Cost* in D15
4. embolden and centre the headings



13				
14	Costs			
15		Price	Number	Cost
16	coke			
17	pepsi			
18	7-up			
19	thumbsa			
20	other			
21				
22				

We enter the prices for each drink

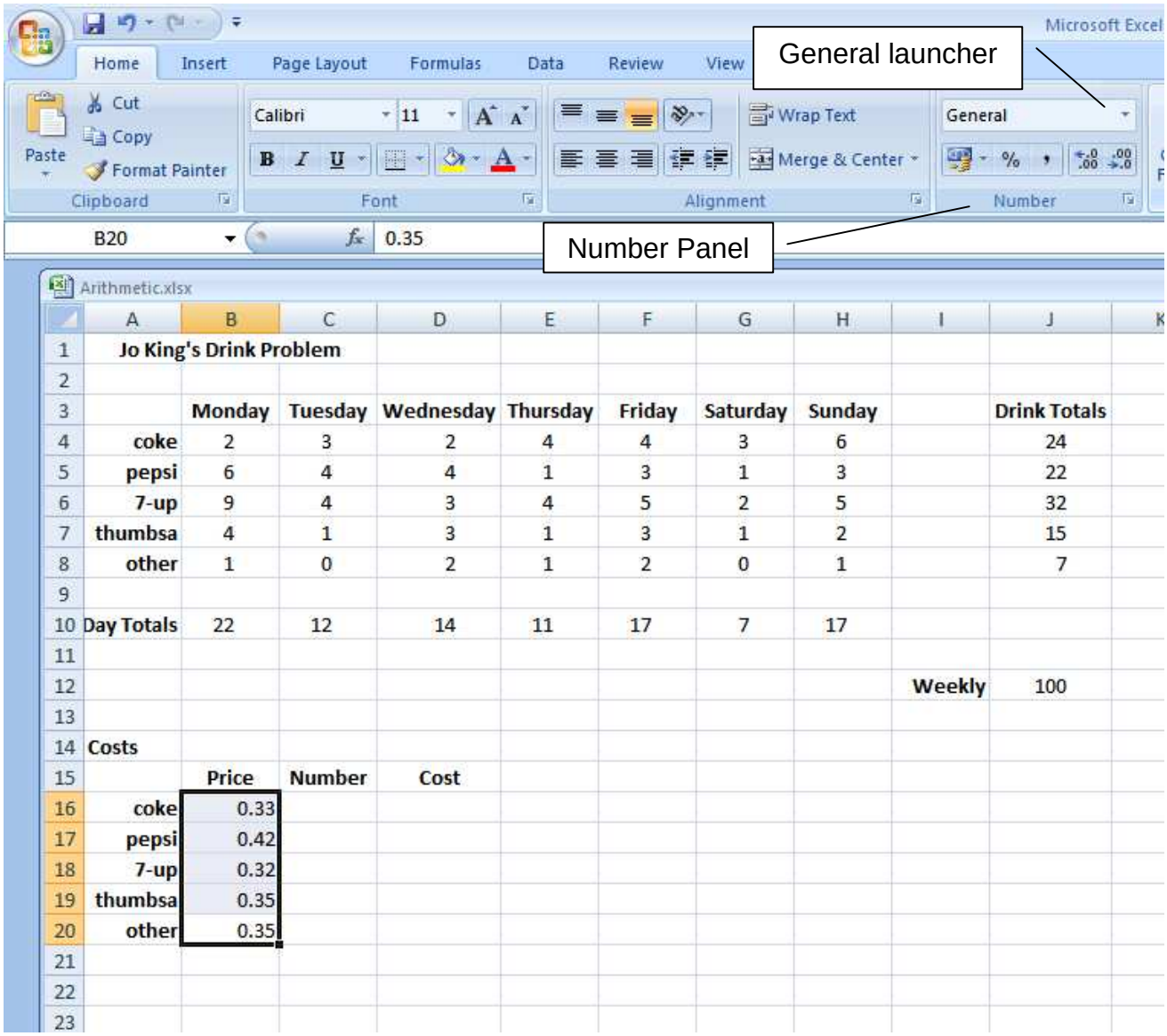
- coke: 0.32
- pepsi: 0.42
- 7-up 0.32
- thumbsa 0.35
- other 0.35. Note: this is an estimation.

13				
14	Costs			
15		Price	Number	Cost
16	coke	0.33		
17	pepsi	0.42		
18	7-up	0.32		
19	thumbsa	0.35		
20	other	0.35		
21				
22				

3.6 Format Cells as Currency

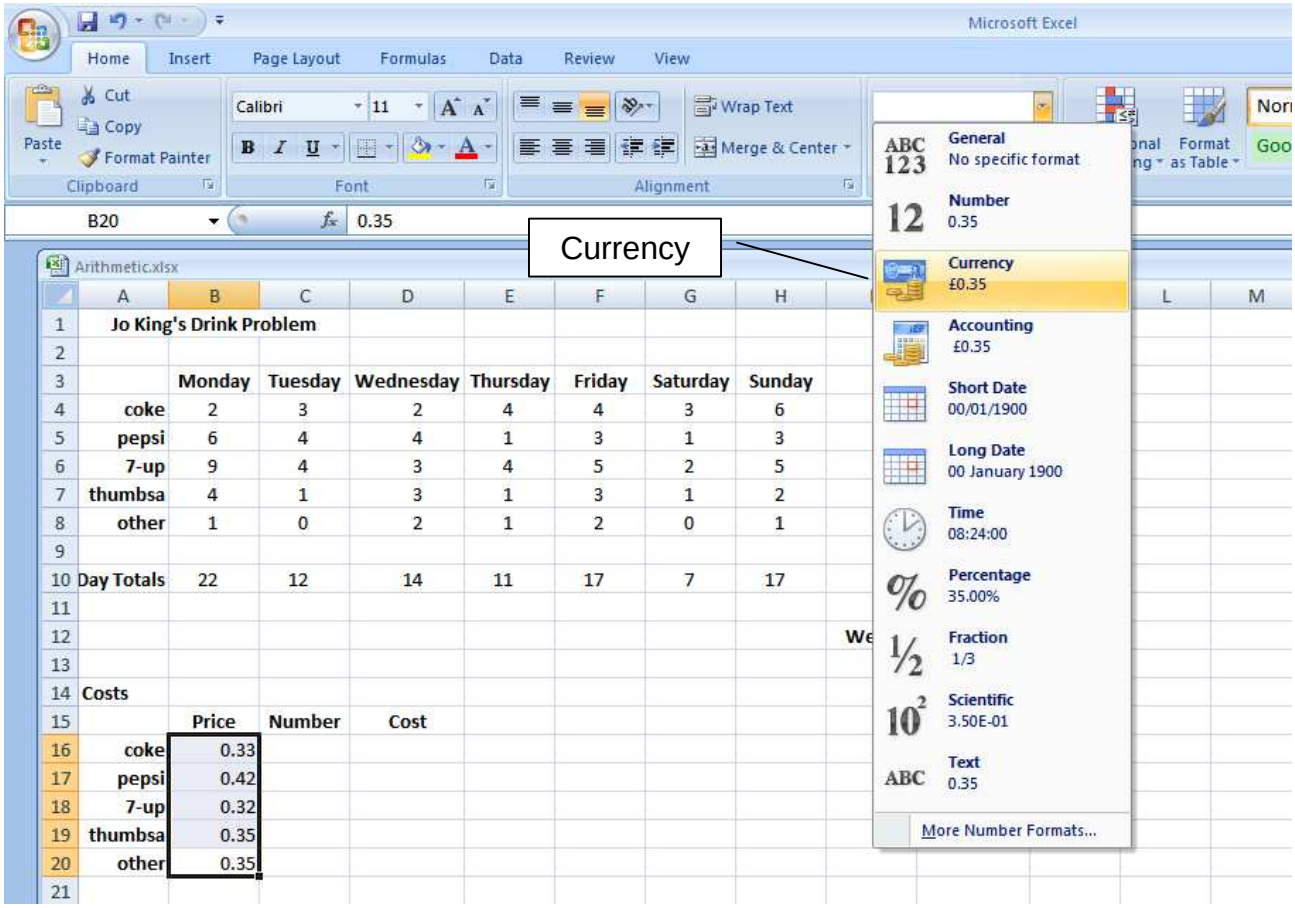
Now we format the costs as currency.

1. select the cells B16..B20
2. in the Number Panel click the General down arrow (known as its launcher)

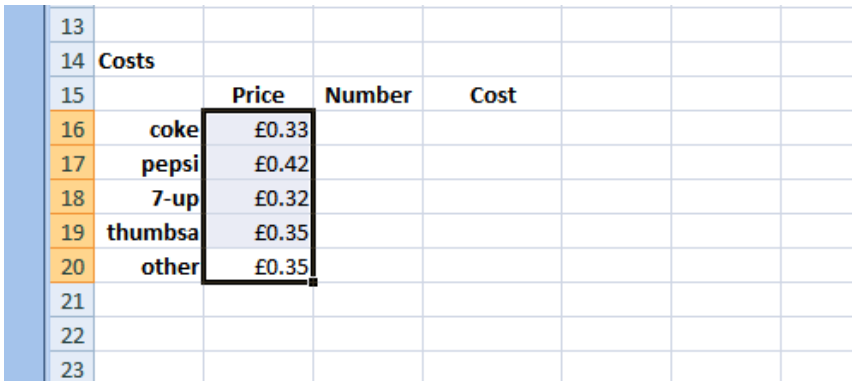


	A	B	C	D	E	F	G	H	I	J
1	Jo King's Drink Problem									
2										
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		Drink Totals
4	coke	2	3	2	4	4	3	6		24
5	pepsi	6	4	4	1	3	1	3		22
6	7-up	9	4	3	4	5	2	5		32
7	thumbsa	4	1	3	1	3	1	2		15
8	other	1	0	2	1	2	0	1		7
9										
10	Day Totals	22	12	14	11	17	7	17		
11										
12									Weekly	100
13										
14	Costs									
15		Price	Number	Cost						
16	coke	0.33								
17	pepsi	0.42								
18	7-up	0.32								
19	thumbsa	0.35								
20	other	0.35								
21										
22										
23										

3. choose Currency



Notice the £ sign is now inserted.



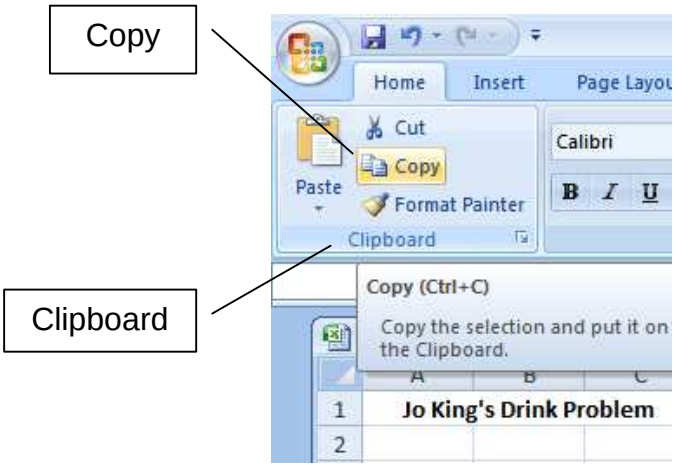
3.7 Paste Special

We have the drinks. We have their prices. Now we just need their numbers. We already have these numbers in Column J under the Drink Totals heading.

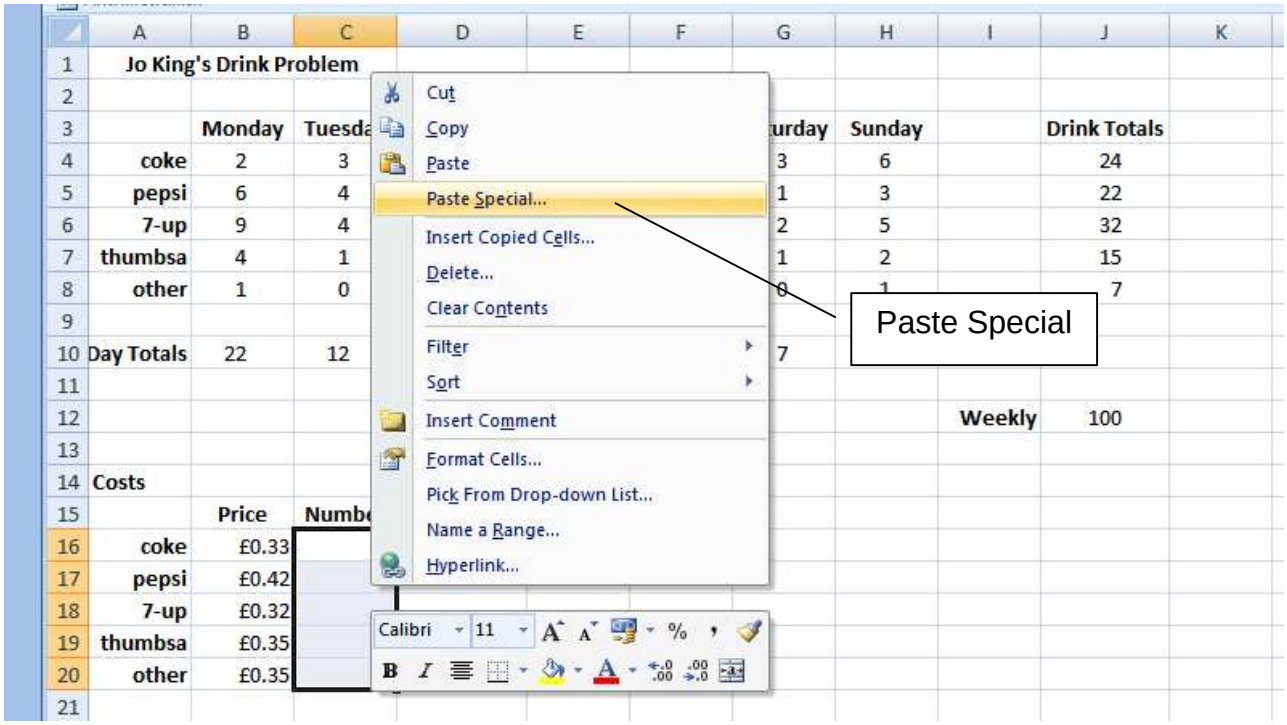
1. highlight the Drink Totals numbers in Column J

	A	B	C	D	E	F	G	H	I	J	K	L
1	Jo King's Drink Problem											
2												
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		Drink Totals		
4	coke	2	3	2	4	4	3	6		24		
5	pepsi	6	4	4	1	3	1	3		22		
6	7-up	9	4	3	4	5	2	5		32		
7	thumbsa	4	1	3	1	3	1	2		15		
8	other	1	0	2	1	2	0	1		7		
9												
10	Day Totals	22	12	14	11	17	7	17				
11												
12									Weekly	100		
13												
14	Costs											
15		Price	Number	Cost								
16	coke	£0.33										
17	pepsi	£0.42										
18	7-up	£0.32										
19	thumbsa	£0.35										
20	other	£0.35										
21												

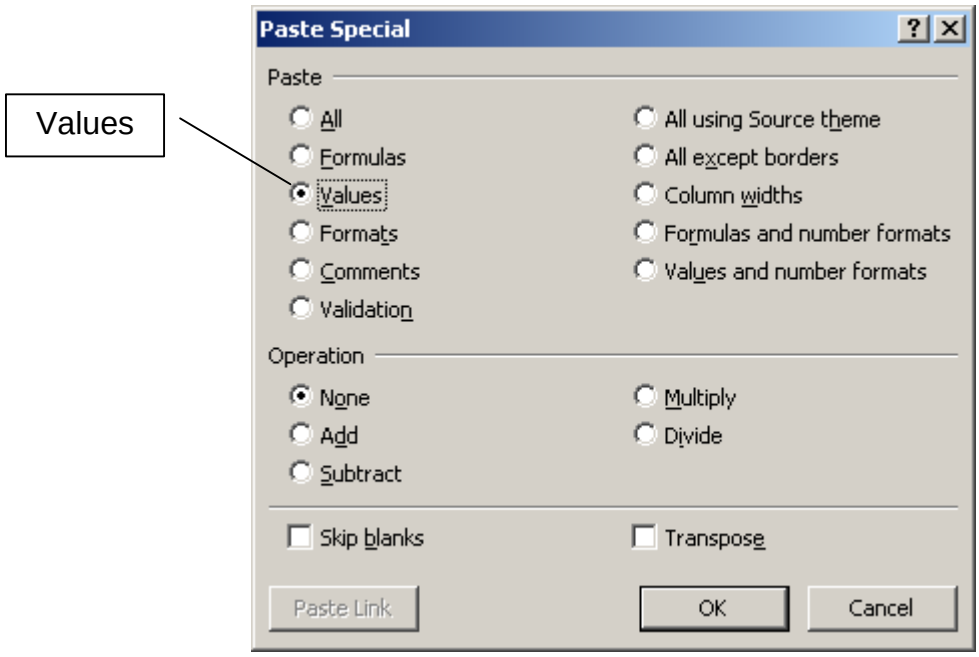
2. on the Clipboard Panel choose Copy



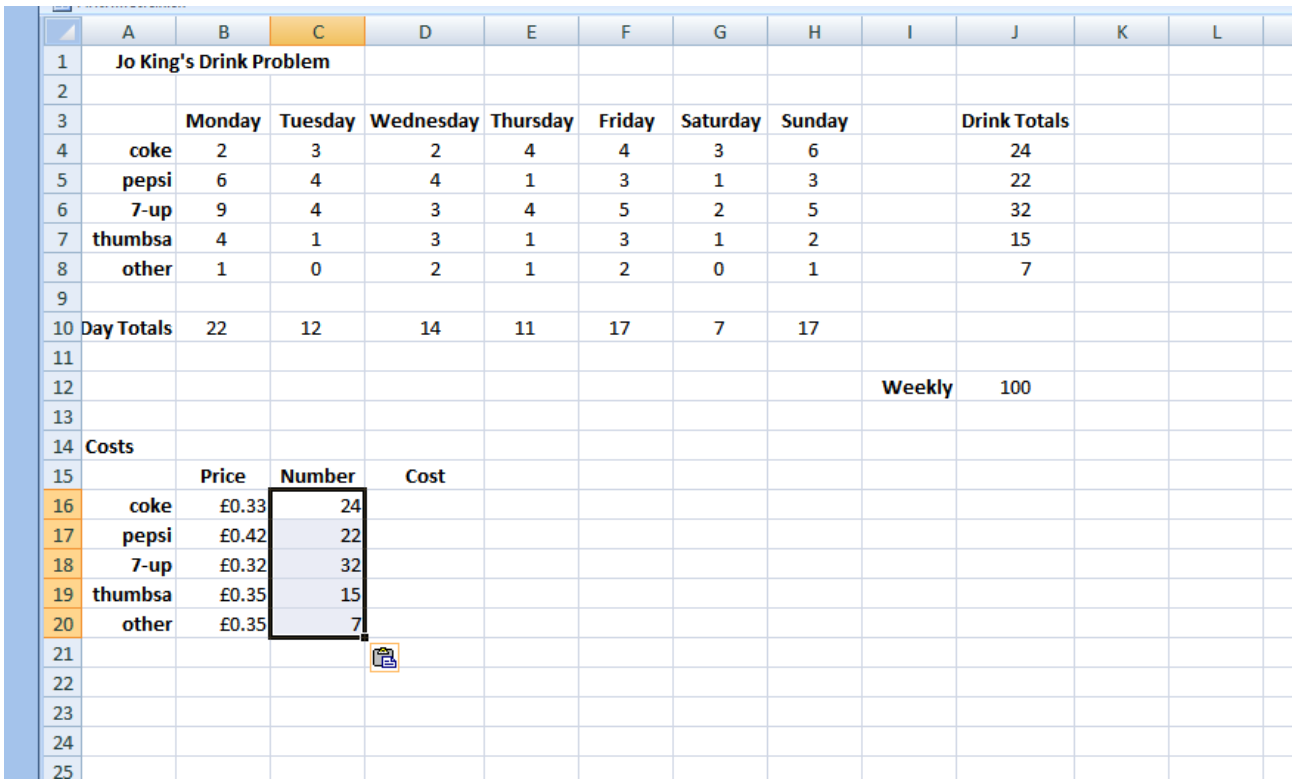
3. highlight C16 to C20 and click the **right** mouse button



4. choose Paste Special



5. select Values
6. click OK

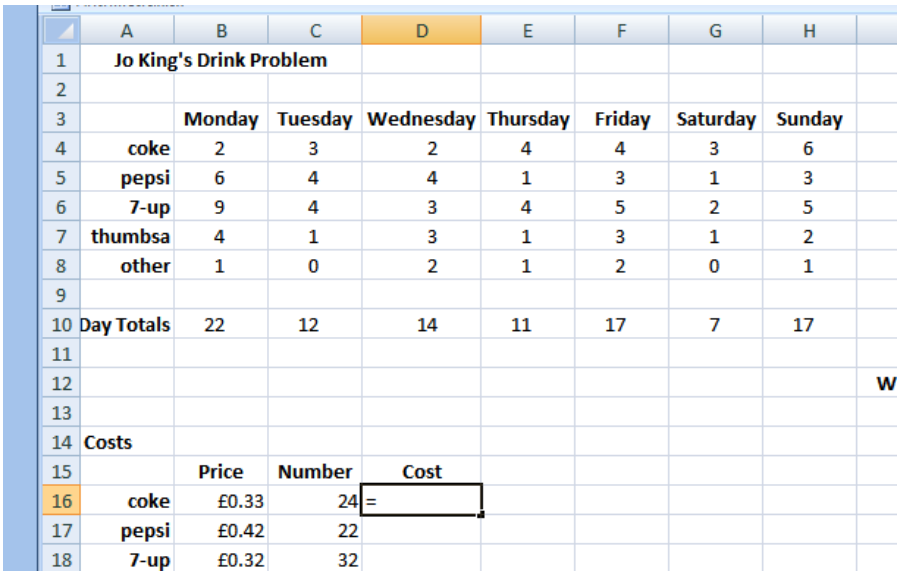


	A	B	C	D	E	F	G	H	I	J	K	L
1	Jo King's Drink Problem											
2												
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		Drink Totals		
4	coke	2	3	2	4	4	3	6		24		
5	pepsi	6	4	4	1	3	1	3		22		
6	7-up	9	4	3	4	5	2	5		32		
7	thumbsa	4	1	3	1	3	1	2		15		
8	other	1	0	2	1	2	0	1		7		
9												
10	Day Totals	22	12	14	11	17	7	17				
11												
12									Weekly	100		
13												
14	Costs											
15		Price	Number	Cost								
16	coke	£0.33	24									
17	pepsi	£0.42	22									
18	7-up	£0.32	32									
19	thumbsa	£0.35	15									
20	other	£0.35	7									
21												
22												
23												
24												
25												

3.8 Multiplication

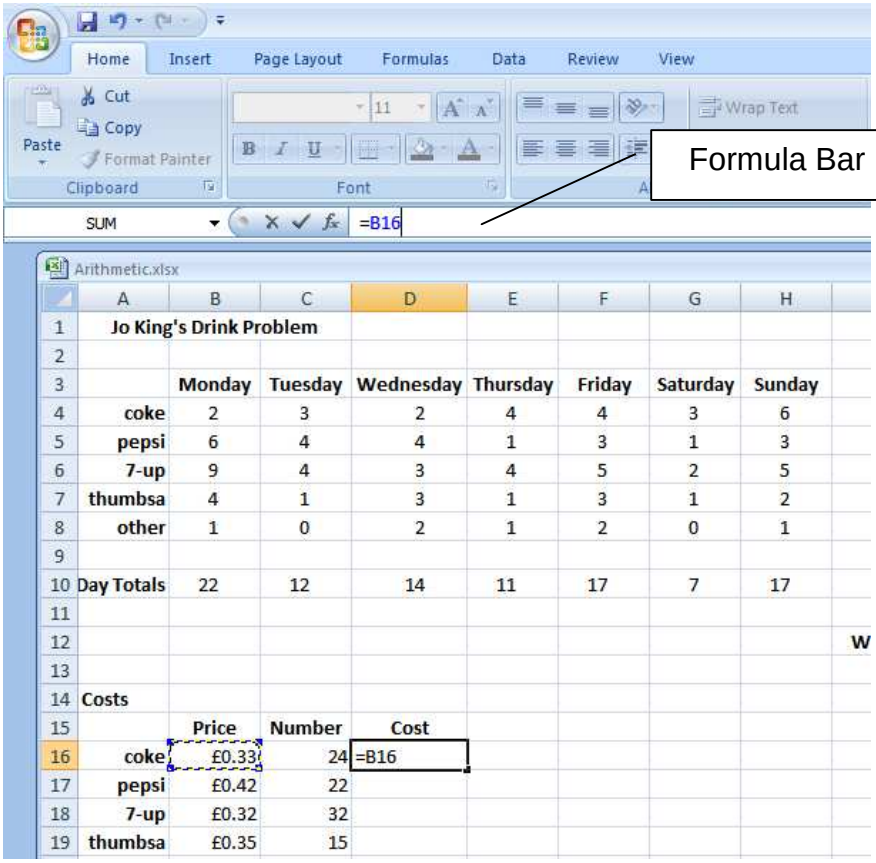
The total cost of the coke is the price of one coke multiplied by the numbers of cokes.

1. in D16 enter =



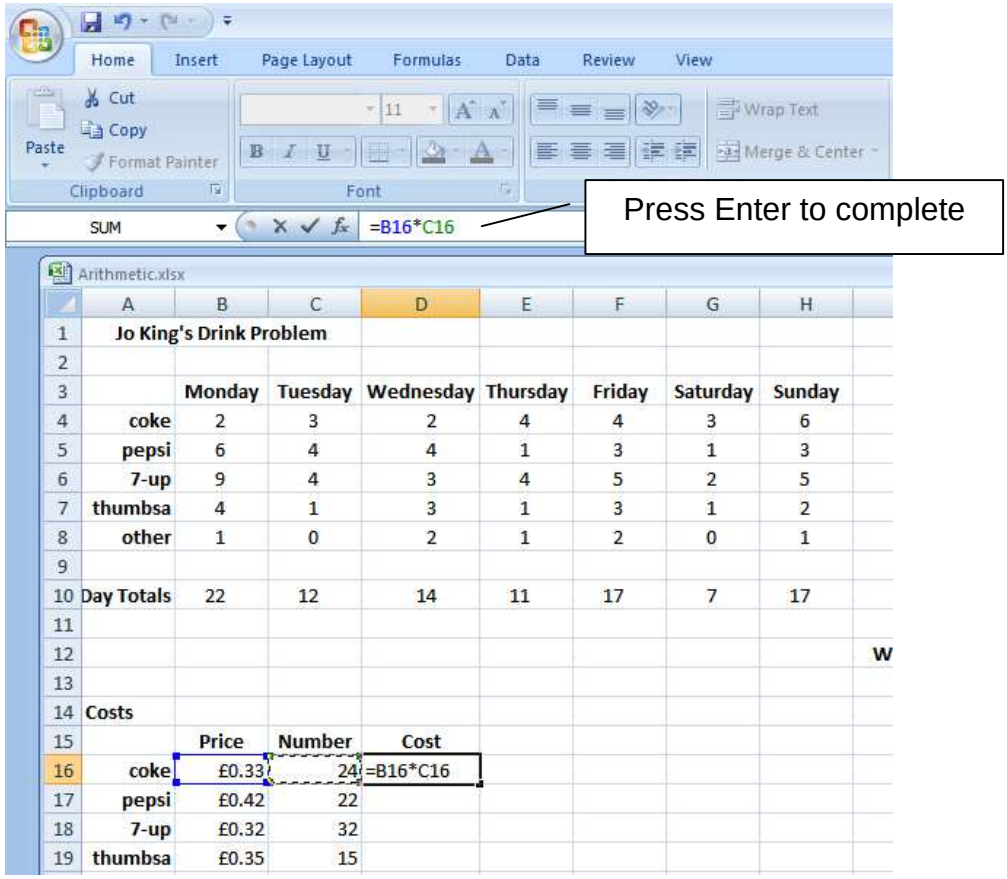
	A	B	C	D	E	F	G	H
1	Jo King's Drink Problem							
2								
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
4	coke	2	3	2	4	4	3	6
5	pepsi	6	4	4	1	3	1	3
6	7-up	9	4	3	4	5	2	5
7	thumbsa	4	1	3	1	3	1	2
8	other	1	0	2	1	2	0	1
9								
10	Day Totals	22	12	14	11	17	7	17
11								
12								W
13								
14	Costs							
15		Price	Number	Cost				
16	coke	£0.33	24	=				
17	pepsi	£0.42	22					
18	7-up	£0.32	32					

2. click in the formula bar
3. click B16



	A	B	C	D	E	F	G	H
1	Jo King's Drink Problem							
2								
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
4	coke	2	3	2	4	4	3	6
5	pepsi	6	4	4	1	3	1	3
6	7-up	9	4	3	4	5	2	5
7	thumbsa	4	1	3	1	3	1	2
8	other	1	0	2	1	2	0	1
9								
10	Day Totals	22	12	14	11	17	7	17
11								
12								W
13								
14	Costs							
15		Price	Number	Cost				
16	coke	£0.33	24	=B16				
17	pepsi	£0.42	22					
18	7-up	£0.32	32					
19	thumbsa	£0.35	15					

4. enter *
5. click C16

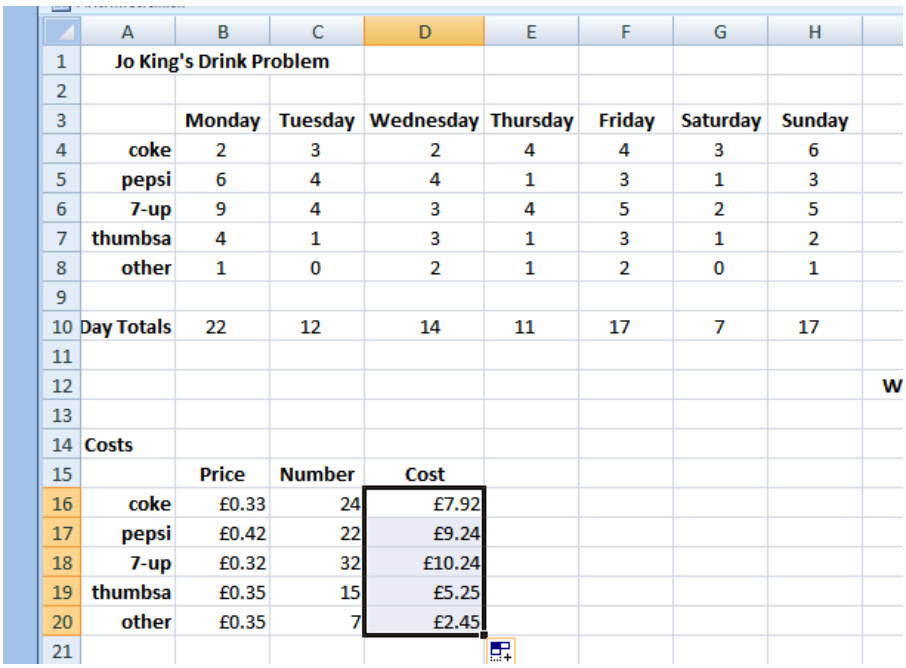


	A	B	C	D	E	F	G	H
1	Jo King's Drink Problem							
2								
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
4	coke	2	3	2	4	4	3	6
5	pepsi	6	4	4	1	3	1	3
6	7-up	9	4	3	4	5	2	5
7	thumbsa	4	1	3	1	3	1	2
8	other	1	0	2	1	2	0	1
9								
10	Day Totals	22	12	14	11	17	7	17
11								
12								
13								
14	Costs							
15		Price	Number	Cost				
16	coke	£0.33	24	=B16*C16				
17	pepsi	£0.42	22					
18	7-up	£0.32	32					
19	thumbsa	£0.35	15					

6. press Enter to complete

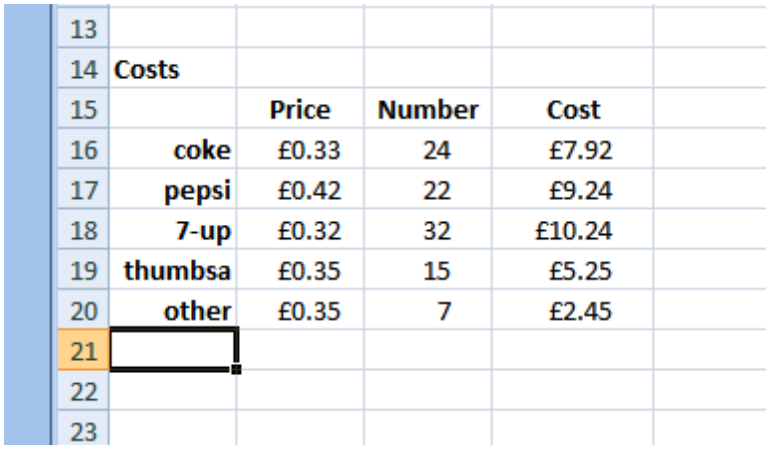
	A	B	C	D	E	F	G	H
1	Jo King's Drink Problem							
2								
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
4	coke	2	3	2	4	4	3	6
5	pepsi	6	4	4	1	3	1	3
6	7-up	9	4	3	4	5	2	5
7	thumbsa	4	1	3	1	3	1	2
8	other	1	0	2	1	2	0	1
9								
10	Day Totals	22	12	14	11	17	7	17
11								
12								
13								
14	Costs							
15		Price	Number	Cost				
16	coke	£0.33	24	£7.92				
17	pepsi	£0.42	22					
18	7-up	£0.32	32					
19	thumbsa	£0.35	15					

7. check that the answer is right. A calculator might be useful.
8. use autofill to complete the Cost column



	A	B	C	D	E	F	G	H
1	Jo King's Drink Problem							
2								
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
4	coke	2	3	2	4	4	3	6
5	pepsi	6	4	4	1	3	1	3
6	7-up	9	4	3	4	5	2	5
7	thumbsa	4	1	3	1	3	1	2
8	other	1	0	2	1	2	0	1
9								
10	Day Totals	22	12	14	11	17	7	17
11								
12								
13								
14	Costs							
15		Price	Number	Cost				
16	coke	£0.33	24	£7.92				
17	pepsi	£0.42	22	£9.24				
18	7-up	£0.32	32	£10.24				
19	thumbsa	£0.35	15	£5.25				
20	other	£0.35	7	£2.45				
21								

9. align the numbers so that they are central under their headings and right justified

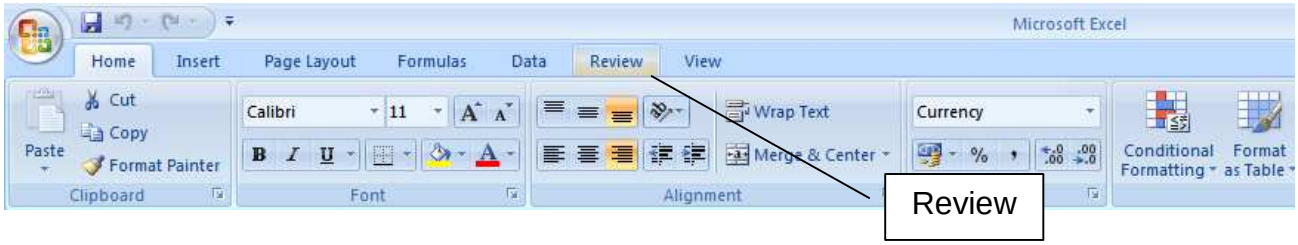


13				
14	Costs			
15		Price	Number	Cost
16	coke	£0.33	24	£7.92
17	pepsi	£0.42	22	£9.24
18	7-up	£0.32	32	£10.24
19	thumbsa	£0.35	15	£5.25
20	other	£0.35	7	£2.45
21				
22				
23				

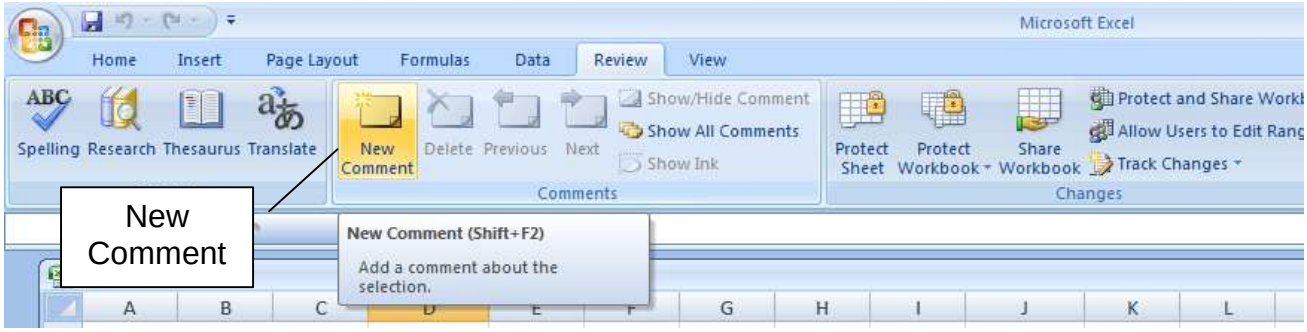
3.9 In-Cell Comments

We explain the formulae we use. Why? To help the reader. The reader could be yourself, your boss, your lecturer, the guy you are teaching, the lazy bum who is copying your work, ... We attach our explanations to appropriate cells. In cell D16 we might comment: *Cost = Price x Number*.

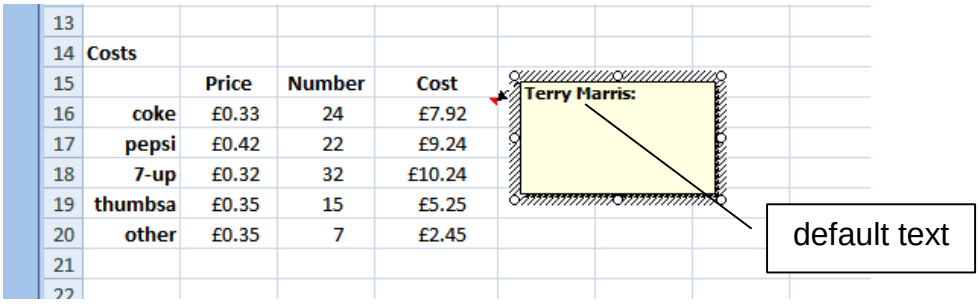
1. make D16 active
2. click on Review



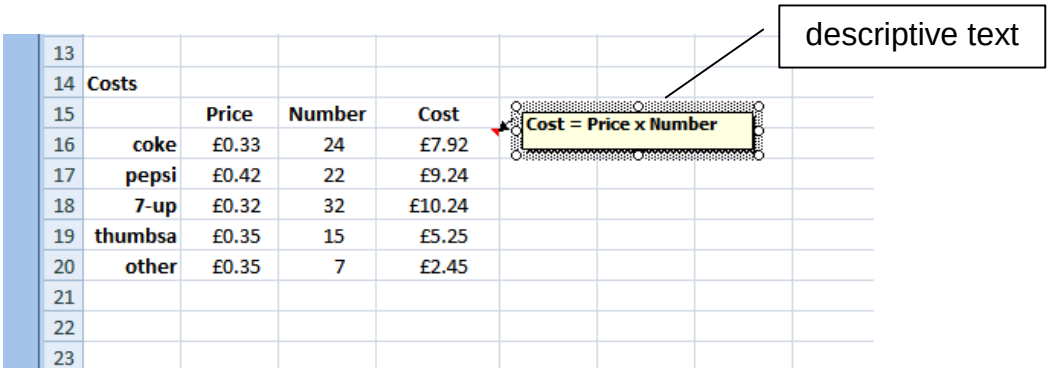
3. choose New Comment



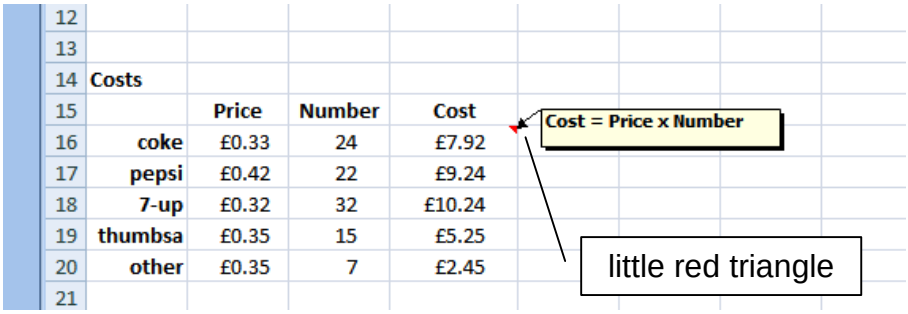
4. replace the default text ...



5. ... with one of your own: Cost = Price x Number
6. adjust the size of the comment text box



When you move your mouse pointer near the little red triangle, your explanatory comment appears.



Costs				
	Price	Number	Cost	
coke	£0.33	24	£7.92	
pepsi	£0.42	22	£9.24	
7-up	£0.32	32	£10.24	
thumbsa	£0.35	15	£5.25	
other	£0.35	7	£2.45	

7. click Home on the Ribbon when finished

In fact, we always write descriptive comments for our formulae. Well, which do you think is easier to understand: B16*C16 **OR** cost = price x number?

3.10 Summary Totals

We find the total weekly cost of the drinks, and estimate the annual cost.

1. in C22 enter *Weekly*, emboldened and right justified
2. in C23 enter *Annual*, emboldened and right justified
3. in D22 enter the formula to sum the weekly costs above
4. in D23 enter the formula to calculate the estimated annual cost. Assume 52 weeks in a year
5. check your answers. A calculator might be useful.

	A	B	C	D	E	F	G	H	I	J	K
1	Jo King's Drink Problem										
2											
3		Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		Drink Totals	
4	coke	2	3	2	4	4	3	6		24	
5	pepsi	6	4	4	1	3	1	3		22	
6	7-up	9	4	3	4	5	2	5		32	
7	thumbsa	4	1	3	1	3	1	2		15	
8	other	1	0	2	1	2	0	1		7	
9											
10	Day Totals	22	12	14	11	17	7	17			
11											
12									Weekly	100	
13											
14	Costs										
15		Price	Number	Cost							
16	coke	£0.33	24	£7.92							
17	pepsi	£0.42	22	£9.24							
18	7-up	£0.32	32	£10.24							
19	thumbsa	£0.35	15	£5.25							
20	other	£0.35	7	£2.45							
21											
22			Weekly	£35.10							
23			Annual	£1,825.20							
24											
25											

3.11 Way of Working

Spreadsheets have errors as dogs have fleas. (Have I said that before?) So, we do a little bit. Check it out. Do a little bit more. Check it out. Do a little bit more. Check it out..... It is easier to find errors in a little bit than it is to find errors in a big bit. This technique is known as stepwise refinement, and is loved and used by professionals all over the world (ask Peter Cooke or Wayne Taylor).

3.12 Precedence

Look at:

4 + 3 x 2 = 7 x 2
= 14

Or

4 + 3 x 2 = 4 + 6
= 10

Which answer is correct? Mathematicians have defined the order in which arithmetic operations should be carried out. You may have heard of BODMAS - Brackets, Of, Divide, Multiplication, Addition, Subtraction?

Operator	Precedence
Brackets	highest
x, /	
+, -	lowest

Brackets are always worked out first. They have the highest precedence or importance.

Mulitiply and divide are next.

Add and subtract are done last. They have the least precedence.

3.13 Exercise

1. Complete the spreadsheet, shown above, that estimates the cost of Jo King's drinking habit.
    a. include a comment, attached to the title, describing WHAT the spreadsheet does
    b. include explanatory comments for each formula (but you do not need to repeat yourself)
    c. remember to include a footnote containing your name and the date
    d. print your **entire** spreadsheet on one side of A4. To do so you might need to:
        i. select Page Layout tab
        ii. click the Set Up Panel launcher (the little arrow in the bottom right hand corner)
        iii. choose Page
        iv. select Fit to (1 page)
        v. OK
    e. print your formulae. You might need to adjust column widths
    f. save your spreadsheet

We have seen how to:

- merge cells
- use autofill
- add up a row of numbers
- use copy and paste, and paste special
- insert a currency symbol
- multiply and
- add comments

Next we look at relative and absolute addressing.

Bibliography

www.homeandlearn.co.uk accessed August 2009