

Business arithmetic's

1. The rule of the three

For example:

4 bottles. Wine	24 €
6 bottles. Wine	X

$$x = \frac{24 \times 6}{4} \quad \underline{\underline{x = 36}}$$

2. The percent arithmetic's

Example: 16 % from 1000 = 160

16 = percentage

1000 = ground value

160 = percent

For discount or sconto purchases

Invoice amount
 - Discount
 = Purchase on credit price
 Sconto
 = Remittance

Example:

A bill for 1000 pieces of menu cards is 96 €

The printing office gives us discount for 8% and sconto for 2%. How much we must pay?

Invoice amount	= 100 % =	96,00 €
- Discount	= 8 % =	8,32 €
= Purchase on credit	= 92 % =	88,32 €
- Sconto	= 2 % =	1,77 €
= Remittance = 98 % =		<u>86,55 €</u>

After the deduction from the discounts we get again the calculated amount for the sconto from 100 %

3. The reduced ground value:

377,20 €	82 %
x	100 %

$$x = 377,20 \times 100 : 82 = \underline{\underline{460}}$$

The beverage wholesale dealer send us a bill for 377,20 € which include already 18% discount.

4. The multiplied ground value:

After the rent increase, the price is now 756 € How high was the rent before?

756 €	↗	112,5 %
x	↘	100 %

x = 672 €

Deficits during meat preparation

$$\begin{aligned} & \text{Purchase quantity} \\ & \text{Cut deficits} \\ \hline = & \text{Already to roast meat} \\ - & \text{Fried deficits} \\ \hline \equiv & \text{ready to serve meat} \end{aligned}$$

A landlord bought 14,2 kg meat. The cut deficit he calculates with 21% and the fried deficit with 32%. How many kilogram meat he can serve?

- Purchase quantity = 14,2 kg
- Cut deficits = 21 %
- **Already to roast meat** = 79 % meet again 100 %
- Fried deficits = 32 %
- **Ready to serve meat** = 68 %

1. 14,2 kg = 100 %
x = 79 % x = 11,218 kg

2. 11,218 = 100 %
x = 68 % x = 7,628 kg

The landlord got 7,6 already to serve meat

The dine cost estimating

1. The starting point is:

- Material or raw material costs
- Direct belonging to cost for the dine like (salary from cooks)
- Not direct belonging to cost for the dine like, lease, service expenses like dishes, laundry, costs for the administration

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Overhead costs

2. The profit

3. The service

4. The value-added tax (turnover tax)

After all the factors was calculated together, we just have to look if the result can be compared with the rivalry's and is competitive to other hotels or restaurants

The cost estimating frame work

Material price
 + Overhead costs

 = Cost price
 + Profit

 = Estimated or business price
 + Service

 = Net price
 + Turnover tax (value added tax)

 = Inclusive price

Example:

Material price	=	2,95 €	=	100 %	
Overhead costs	=		=	+ 104 %	
Cost price	=	204 %	=	6,02 €	= 100 % + 22 % Profit
Estimated price	=	122 %	=	7,34 €	= 100% + 15 % Service
Net price	=	115 %	=	8,44 €	= 100 % + 16 % Turnover tax
Inclusive	=	116 %	=	9,79 €	= final price

Result = 9,80 €

The retrograde cost estimating

Retrograde cost estimating means that we calculate back from the inclusive price to the material price.

Material price	=	6,51 €	=	100 %			↑
Overhead costs	=		+	82 %			
Cost price	=	182 %	=	11,84 €	-	17% Profit	
Estimated price	=	117 %	=	13,85 €	-	12% Service	
Net price	=	112 %	=	15,52 €	-	16% Turnover tax	
Inclusive price	=	116 %	=	18 €			

$$\begin{array}{lcl}
 116 \% = 18 & & 112 \% = 15,52 & & 117 \% = 13,85 \\
 100 \% = x & x = \underline{15,52} & 100 \% = x & x = \underline{13,85} & 100 \% = x & x = \underline{11,84}
 \end{array}$$

$$182 \% = 11,84$$

$$100 \% = \underline{6,51}$$

The answer is: 6,51 €

We calculate just the same way back, we start with the inclusive price and go back to the material price.

Profit calculation

Material price	=	4,20 €	=	100 %			↓ ↑
Overhead cost	=		+	125 %			
Cost price	=	225 %	=	9,45 €	=	100 %	
Estimated price	Profit = X	=	11,68 €	-	15 % Service		
Net price	=	115 %	=	13,44 €	-	16 % Turnover tax	
Inclusive price	=	116 %	=	15,60 €	=	final price	

$$\begin{array}{lcl}
 1) \ 100 \% = 4,20 & & 2) \ 116 \% = 15,60 \\
 225 \% = x & x = \underline{9,45 \text{ €}} & 100 \% = x & x = \underline{13,44 \text{ €}}
 \end{array}$$

$$\begin{array}{lcl}
 3) \ 115 \% = 13,44 \\
 100 \% = x & x = \underline{11,68 \text{ €}}
 \end{array}$$

$$11,68 \text{ €} - 9,45 \text{ €} = \underline{2,23 \text{ €}}$$

$$100 \% = 9,45 \text{ €}$$

$$x = 2,23 \text{ €} \quad \underline{x = 23,6 \%}$$

The profit is 2,23 € this is 23,6%

We calculate first from the inclusive price to the calculated price and then we calculate from the material price to the cost price. The two results will be subtracted from each other. That's the way to get the profit. With the help from the rule of three we can get the value in percent.

Cost estimating charge

Material price	100 %		100, - €
Overhead cost	130 %		
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Cost price	230 % = 100 %		230, - €
<hr/>			
Profit	25 %		
<hr/>			
Estimated price	125 %		287.50, - €
<hr/>			
Service	15 % = 100 %		
<hr/>			
Net price	115 %		330.63, - €
<hr/>			
Value added tax	16 % = 100 %		
<hr/>			
Inclusive price	116 %		383.53, - € = <u>383.53 %</u>
<hr/>			
Cost estimating charge			= <u>283.53 %</u>

To simplify, we can use this cost estimating charge. Here we always calculate with 100, therefore we can get the charge also in percent.

The cost estimating charge is the difference between the material requisition and the inclusive price, expressed in percent and refer to the material costs.

Material price	= 100 %
+ Cost estimating charge	= 283,53 %
= Inclusive price	= 383,53 <u>%</u>

Example:

The food cost:	4,50 € = 100 %
Cost estimating charge	283,53 % = 12,76 €
Inclusive price:	383,53 % = <u>17,26 €</u>

The cost estimating factor

The cost estimating factor is the percentage from the inclusive price.

If we inclusive price with 383,53%, like on the example up, than we have a cost estimating factor from **3,84 %**. If I calculate this factor already that I can estimate all dines.

But if ever there are some changes about a higher value added tax, or labour costs etc., than I have to calculate this factor new.

100 % =	4,50
383,53 % = x	x = <u>17,26 €</u>

4,50 € x 3,84 = <u>17,28 €</u>

The cost estimating factor can be, depend on the market situations, round up or round off. If the rivalry is more favourable, than we can round off the cost-estimating factor, or we calculate a new one, we could get, for example, lower profit.

The cost estimate for beverage

What we call material price for the dine costing, we call here price of supplier

Price of supplier:

- He is consist of, the price from bought goods, plus the costs for transport (freight, cargo) and the packing as well as insurance's

Direct cellar costs:

- That are the salary for the service staff, the illumination, air condition and the keeping of the cellar

Cellar overhead costs:

- This is consist to, the prorated costs from the cellar to the total costs from the hotel, like deprecations, lease, and interests

Service costs:

- This is the part of the costs, which we get into the restaurant. This is depending of the kind of modern conveniences.

The summarised points are also known as overhead costs!

A glass brandy cost 0.37 € How much is the inclusive price after the glass was sold?
The following costs we have to calculate:

- Overhead costs: 95 %
- Profit : 48 %
- Service: 15 %
- Value added tax: 16 %

Price of supplier	100 %	0.37	€
Overhead cost	95 %		
Cost price	195 % = 100 %	0.72	€
Profit	48 %		
Estimated price	148 % = 100%	1.07	€
Service	15 %		
Net price	100% = 115 %	1.23	€
Value added tax	16 %		
Inclusive price	116 %	1.42	€

More simple method, also usable for all other costs estimating

We just reduce the set from the percent through 100 and we get a multiply factor
On this example it could look like this:

0.37 x 1.95 x 1.48 x 1.15 x 1.16 = 1.42

Example:

We buy one bottle of brandy with a content of 1liter for 17.90 €

Serving deficits is 2.5 %

1 L = 100cl 100% = 100cl

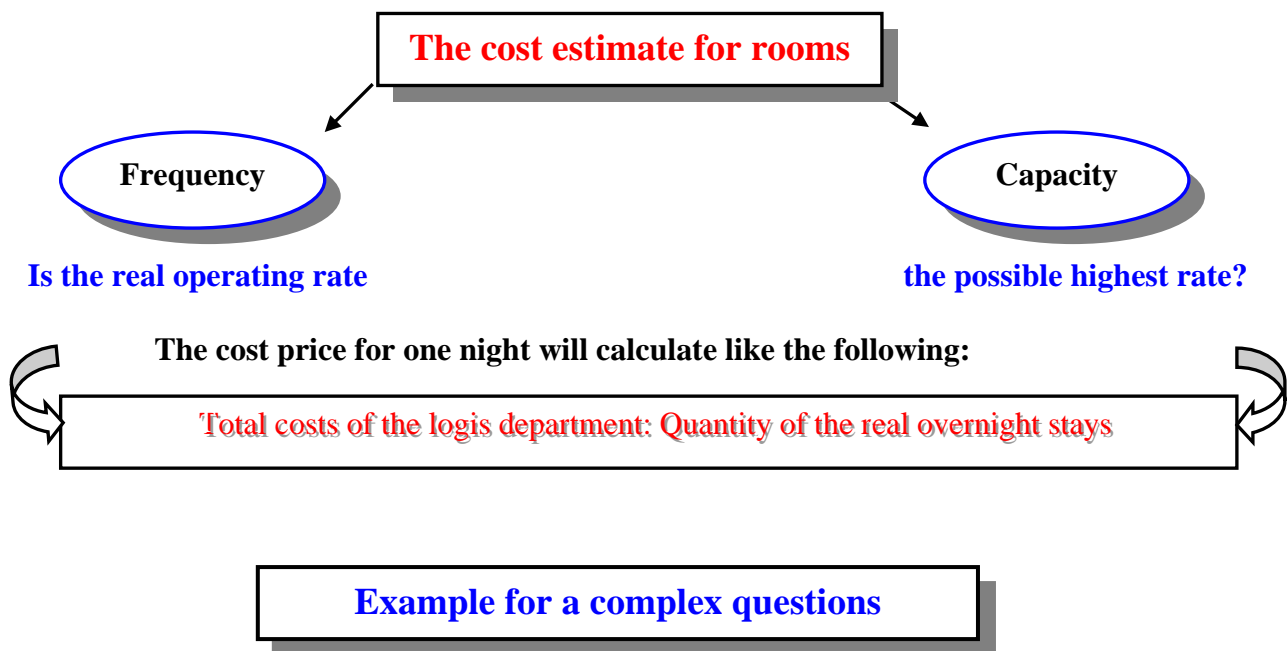
97.5% = 97.5cl

97.5cl : 2cl(1glass) = 48.75 glasses.

The supplier price will be calculated like the following:

Der Bezugspreis für 1 Glas errechnet sich wie folgt:

- For 2cl we can serve all together 48 glasses.
- The purchase price for one glass 0.37 € (17.90: 48.75 = 0.37).



The new renovated hotel „Villinger Hof“ has through his high capital investigation from 916449 € very high costs.

The hotel facilities have 80 rooms, which are occupied by 58%. The price for one night is 55 € and it's already the highest limit. The price is already inclusive of all charges.

- How is the yearly deficit of the hotel?
- How big must be the inclusive price, if the hotel will get 5% profit, with the same conditions for frequency and the usual charges? (Price round up)
- How big should be the frequency, if the hotel will get a cost recovery with the room price from 55 €? (Without any profit)

a)

1. 365 days x 80 rooms = 29200 rooms could be used
2. 29200 = 100%
x = 58% x = 16936 are already used for one year

Estimated price	100 %	41,23 €
Service	15 % = 100 %	
Net price	115 %	47,41 €
Value added tax	16 % = 100 %	
Inclusive price	116 %	55 €

To get the real costs, we must divide the investigation through the quantity of real overnight stays.

3. 916449: 16936 = 54,11 €
4. 54,11 € - 41,23 = 12,88 x 19936 = **218135,68 € is the deficit**

b)

We set off the now the price from 54,11 € with the 5% profit to solve question “B”

$$54,11 \times 1.05 \text{ (Profit)} \times 1.15 \text{ (Service)} \times 1,16 \text{ (Turnover tax)} = 75,79 \sim 76 \text{ €}$$

The price with a 5 % profit should be 76 €

c)

The cost divided through the cost price is the frequency from the hotel.

$$916449: 41,23 = 22227 \text{ € that means:}$$

$$29200 \text{ €} = 100\%$$

$$22227 \text{ €} = x \quad x = 76 \%$$

**With a price with a 55 €, the frequency should be 76% to work cost recovery
Cost recovery actually means, just a correspondence from the cost price and the estimated price, so there is no profit!**