% Recap

5% of (multiply)
calculator [SHIFT] [C] [=]   Input %
into your calculator

$0.05 = 5\%$

$104\% \Rightarrow 1.04$

VAT ⇒ Value Added Tax

Eg1) A TV costs €647, VAT is charged at 17%
Find the cost of the TV after the VAT is added?

$647 \times 17\% = 109.99$ VAT
Cost after the VAT $= 647 + 109.99 = €756.99$

OR $647 \times 1.17 = €756.99$

$647 \times 117\% = €756.99$

Eg2) A laptop is sold for €1028.50 which includes
VAT at 21%. Find the cost of the laptop before the
VAT was added on.

Laptop + VAT = Total cost
$100\% + 21\%$ $= €1028.50$
?

$121\% = 1028.50$
$1\% = \dfrac{1028.50}{121} = 8.5$

$100\% = 8.5 \times 100 = €850$

Unitary method
Work back to find
1%
Divide the value by
the %

Eg3) A phone cost €571.95 after VAT of 23% is added
on. Find the cost of the phone befor VAT.

Phone + VAT = Total cost
$100\% + 23\% = €571.95$
?

$123\% = 571.95$ $\dfrac{571.95}{123\%} = 465$

$1\% = \dfrac{571.95}{123} = 4.65$

$100\% = 4.65 \times 100 = €465$ cost befor the vat.

$100\% = 4.65 \times 100 = €465$ cost befor the vat.

Eg4) A plumber charges €2500 before VAT is added. The charge after the VAT is added amounts to €2837.50. Calculate the rate of VAT charged?

$$VAT$$
$$2837.50 - 2500 = 337.50$$

$$\frac{337.50}{2500} \times 100 = 13.5\%$$

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T&T2 4.1
VAT - profit...

T&T2 4.1
VAT - profit...

Applied Arithmetic   chapter **4**

49   Section 4.1 **VAT – Profit and loss**

Example 1

The rate of VAT on electrical goods is 23%.

(i) Find the selling price of a washing machine priced at €650 + VAT.
(ii) If the selling price of an *ipad* is €738, find its price before VAT is added on.

Example 2

A rail fare goes up by 6% to €42.40.
What was the old fare?

Example 3

By selling a car for €14 400, a dealer would lose 4% on the purchase price.

(i) What did the dealer pay for the car?
(ii) Find his percentage profit if he had sold the car for €17 250.

Exercise 4.1

1. Express each of these percentages as decimals:

   (i) 7%   (ii) $3\frac{1}{2}$%   (iii) 12%   (iv) 15%   (v) $16\frac{1}{2}$%

   (vi) 104%   (vii) 110%   (viii) 114%   (ix) 125%   (x) $87\frac{1}{2}$%

2. (i) Increase 120 by 10%   (ii) Increase 150 by 6%

    (iii) Decrease 600 by 5%   (iv) Decrease 820 by $12\frac{1}{2}$%

3. Train fares are increased by 4%.
   (i) Find the new fare if the old fare was €28.
   (ii) If the new fare is €36.40, find the old fare.

i) $28 \times 104\% = €29.12$

ii) $104\% = 36.40$

   $1\% = \dfrac{36.40}{104\%} = €35$

4. The price of a theatre ticket goes up 7% to €26.75.
   What was the price before the increase?

$107\% = 26.75$

$1\% = \dfrac{26.75}{107} = 0.25$ $\dfrac{26.75}{107\%} = 25$

$100\% = .25 \times 100 = €25$

% Profit, % Loss, Margin and Mark up.

Cost price → the price the shopkeeper buys the product for.

Marked price/ Selling price → The amount the shopkeeper sells the product for.
   Cost price + profit.

% Profit $= \dfrac{\text{Profit}}{\text{Cost Price}} \times 100$ Profit = Selling — Cost
                                   Price   Price.

$100\% = \cdot 25 \times 100 = €25$

$$\% \text{ Profit} = \frac{\text{Profit}}{\text{Cost Price}} \times 100 \qquad \text{Profit} = \text{Selling Price} - \text{Cost Price}.$$
Mark up.

$$\% \text{ Loss} = \frac{\text{Loss}}{\text{Cost Price}} \times 100 \qquad \text{Loss} = \text{Cost Price} - \text{Selling price}.$$

Margin : on an item sold it is the profit as a % of the selling price.

$$\text{Margin formula:} \quad \frac{\text{Profit}}{\text{Selling Price}} \times 100$$

Eg 1) It costs a café 48 cent (cost price) to make a cup of coffee. A customer buys the cup of coffee for €3·00 (selling price). Calculate

i) The mark up

$CP = \cdot 48$
$SP = 3\cdot 00$

$$\text{Profit} = \begin{array}{r} 3\cdot00 \\ -\cdot48 \\ \hline 2\cdot52 \end{array}$$

$$\% \text{ profit} = \frac{2\cdot52}{\cdot48} \times 100$$
525%

ii) the margin.

$$\frac{\text{Profit}}{\text{Selling Price}} \times 100$$

$$\frac{2\cdot52}{3\cdot00} \times 100$$

$= 84\%$

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5. The price of a bicycle is €520 plus VAT at 23%.
   Find the price of the bicycle after VAT is added.

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6. The price of a television set is €984.
   If this includes VAT at 23%, find the price before VAT is added.

$$123\% = \frac{984}{123} = 8 = 1\%$$

$$100\% = 8 \times 100 = €800$$

$$\frac{984}{123\%} = €800$$

7. An electricity bill amounts to €204.30 after VAT at $13\frac{1}{2}$% is added.
Find the amount of the bill before VAT is added.

$$\underset{100\%}{Bill} + \underset{13.5\%}{VAT} = \underset{204.30}{Total\ Bill}$$

$$113.5\% = 204.30$$
$$1\% = \frac{204.30}{113.5\%} = €180$$

8. In a sale, the price of a piece of furniture was reduced by 15%.
If the sale price was €1360, what was the price before the sale?

$$100\% - 15\% = 85\%$$

$$85\% = 1360$$
$$1\% = \frac{1360}{85} \quad 16$$
$$100\% = 16 \times 100 = €1600$$

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9. In a sale, the marked prices are reduced by 30%.
  (i)   Calculate the sale price of a jacket if the marked price is €350.
  (ii) Find the marked price of a dress if the sale price is €168.

10. By selling a jacket for €416, a store makes a profit of 30%.
   (i) Find the cost price of the jacket.
   (ii) If the jacket is reduced by 10% in a sale, calculate the percentage profit the store now has on the cost price.

11. By selling a laptop for €1150, a store makes a profit of 25%.
At what price should the laptop be sold to make a profit of 20%?

12. When an item is sold for €176, the profit is 10% on the cost price. When the selling price is increased to €192, calculate the percentage profit on the cost price.

13. A greengrocer buys 30 boxes of strawberries at €5.25 each and sells 28 of them at a profit of 30%. If the remaining two boxes are unsaleable, find his percentage profit on the deal.

14. The price of a games console is €615 which includes VAT at 23%.

Store A offers a discount of 24% on the selling price.
Store B says it will not charge VAT.
Store C says it will reduce the price before VAT is added by 25% and then charge VAT at 23% on the reduced price.

In which store is the selling price the cheapest and by how much?

15. *Kelly Og's* Corn Flakes are sold in standard packs of 500 g for €2.40.
During a promotion, the quantity in a pack is increased by 20%, but the price stays the same.
Calculate the percentage reduction in the price per kilogram during the promotion.

16. A shop advertised "Everything half price in our sale", but also now advertises that there is "An additional 15% off sale prices".
To what percentage reduction on the original price is the new offer equivalent?