

BASIC MATHEMATICS

MATH 0101

PERCENTAGES

PERCENTAGE (%)

- The word percentage comes from the Latin word for **100**, **centum**
- The word **per**, translated here as 'out of'.
- Percentage thus means 'out of 100'.



- ⦿ '4 792 articles were exported out of a total production of 9 584'
- ⦿ '50 out of every 100' – 50 per cent

→ gives a much clearer idea.

- ⦿ The sign % is used for 'per cent',
 - 17 per cent is often written 17%,
 - 50 per cent, 50%.

Changing Fractions and Decimals to Percentages

- Fractions, decimals and percentages are all linked together

| Rule 1 | Rule 2 |
|---|---|
| To change a fraction to a percentage write down the fraction and multiply it by $100/1$. | To change a decimal to a percentage multiple the decimal by 100 and put the % sign. |

Try!!

1. Change the following fractions to percentages:

- a) $\frac{1}{2}$
- b) $\frac{5}{12}$
- c) $\frac{3}{10}$

1. Change the following mixed numbers to percentages

- a) $3 \frac{4}{5}$
- b) $4 \frac{3}{8}$
- c) $3 \frac{2}{3}$

2. Change the following decimals to percentages:

- a) 0.58
- b) 0.964
- c) 0.855

Changing Percentages to Fractions and Decimals

| Rule 3 | Rule 4 |
|---|---|
| To change a percentage to a fraction write down the whole number of the percentage as the <i>numerator</i> , and write down 100 as the <i>denominator</i> . Then cancel if you can . | To change a percentage to a decimal write down the percentage and divide it by 100 . |

$$64\% = 64/100$$



$$62.5\% = 62 \frac{1}{2} / 100$$



$$85\% = 85.00 \div 100 =$$



$$61.25 = 61.25 \div 100 =$$

Try!!

1. Change the following percentages to fractions in their lowest terms:

- a) 30%
- b) $87 \frac{1}{2}\%$
- c) 12%
- d) $27 \frac{1}{2}\%$
- e) 55%

2. Change the following percentages to decimal fractions:

- a) 31%
- b) 45.5%
- c) 62.5%
- d) 73.5%
- e) 65%

Finding a Percentage of a Quantity

- ⦿ In business we often have to calculate a certain percentage of a given quantity,
- ⦿ Eg:
 - 10 per cent of a sum of money,
 - 30 per cent of a quantity of raw material of some sort,
 - calculate discounts to customers,
 - profit margins on goods for sale, in percentage terms.

Rule 5

Write down the percentage required and **multiply it by the original quantity.**

Example:

- Our firm adds on 1/3 per cent to cost prices to find its selling prices. Calculate how much we should add to items costing; (a) 84 pence; (b) £5.25; (c) £180.

$$1/3 \times 84 \text{ pence} = \underline{28 \text{ pence}}$$

$$1/3 \times £5.25 = \underline{£1.75}$$

$$1/3 \times £180 = \underline{£60}$$

Try!!

1. Calculate the following percentage parts:

- a) 50% of £120
- b) 20% of £1 200
- c) $37\frac{1}{2}\%$ of £400
- d) $2\frac{1}{2}\%$ of £50
- e) 34% of £720
- f) 56% of £480

2. Calculate the following percentage parts:

- a) 24% of 300 tones
- b) 44% of 720 kg
- c) 17% of 400 liters
- d) 38% of 25 km

Discounts

- ◎ It is a **common** business practice to deduct a certain percentage from the price of an article.
- ◎ This reduction in price is called a discount and the types are :
 - cash discounts,
 - trade discounts

cash discounts

- ① increase the chance that a buyer will pay quickly, therefore providing the seller with cash more quickly.
- ① Since most customers would try to benefit from the cash discount, such a practice encourages customers to pay early.

Cash discounts (eg.)

**Cash Discounts are expressed as:
%/days,N/days**

- Suppose Company A sells certain goods at a price of \$4,400 with **terms of payment of 2/10 n/20**.

customer may take a 2% discount on payments made within 10 days of the invoice date

If customers do not take the cash discount, they still have up to 30 days to pay the Net invoice total

After 30 days, customers owe late fees

Try!!

- ◎ On July 1st the firm billed a customer for a \$ 10 000 invoice with terms of 2/10,N/30
 - a) If customer paid on July 10th . How much the customer need to pay?
 - b) If customer paid after July 11th. How much the customer need to pay?
 - c) If customer paid after July 31th. What will happen?

Trade discounts

- ⦿ are much larger
- ⦿ given to traders who buy wholesale and sell retail.
- ⦿ For example:
 - a **high-volume wholesaler** might be entitled to a **40%** trade discount,
 - a **medium-volume wholesaler** is given a **30%** trade discount.
 - A **retail customer** will receive **no trade discount** and will have to pay the published or list price.
- ⦿ The use of trade discounts allows for having just one published price for each product.

Try!!

1. A trader orders goods at a catalogue price of £350. He is given a 25 percent trade discount on the invoice and is then allowed to deduct 5 percent from the final (i.e. net) invoice price if he pays cash. He does pay cash, so what does he pay?
2. A trader orders goods at a catalogue price of £285. He is given a trade discount of 45 percent, and then a cash discount of $2\frac{1}{2}$ percent on the final invoice price. What does he pay in the end for these goods?