

EXPERIMENTAL & SCIENTIFIC REPORTS

Experiments

1. **Investigative question** : What you are trying to determine – it must be in the form of a question.
2. **Problem statement** : What you are trying to determine – it must be in the form of a statement.
3. **Hypothesis** : **Predict** the outcome of the research.
4. **Precautions** : It is the measures that you should take to ensure that your experiment succeeds. Like heating your test tubes in a warm bath of water in stead of heating them over an open flame.
5. **Safety measures** : It is the measures that you should take to ensure your own safety. Like wearing gloves and safety goggles.
6. **Variables:**
 - **Independant variable** : The variable which you control.
 - **Dependant variable** : The variable which changes due to the change in the independent variable.
 - **Scientific variable** : The factors that must be kept constant.
7. **Observation** : The things you can see (change in color), feel (change in heat) or hear (fuzzing due to the production of a gas), etc.
8. **Results** : Most of the time there is a correlation between the Independent and dependant variables. It can be directly proportional or indirectly proportional. The correlation can be given as a graph or a methematical relationship.

8.1 Graphs:

The independent variable is always on the x-axis while the dependent variable is always on the y-axis.

All graphs have the following:

- A title
- Axes should be labeled using the right units
- Correct scale format

8.2 Interpretasie van Grafieke

You will be required to show the relationship between two sets of data.

8.2.1 Directly proportional

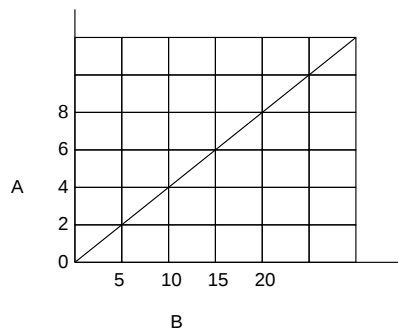
If one amount is doubled, the amount in the other data set with which it is directly proportional will also double. Any change in one amount will result in the same degree of change in its corresponding amount.

A	B	A/B
2	5	0,4
4	10	0,4
6	15	0,4
8	20	0,4

The two main features of **direct proportions** are:

- (a) A graph of A and B produces a straight line going through the origin.
(b) $A/B = \text{a constant}$ (shown in the table above $k = 0,4$). The value of A can therefore be determined by multiplying B with this constant. Direct proportions can be symbolically illustrated:

$A \propto B$ or $A = kB$, with k as the constant.



8.2.2 Indirectly proportional

When you have two sets of data which is indirectly proportional, the one set will decrease evenly as the other set increases. If the amount is doubled, the other will be halved, and so forth.

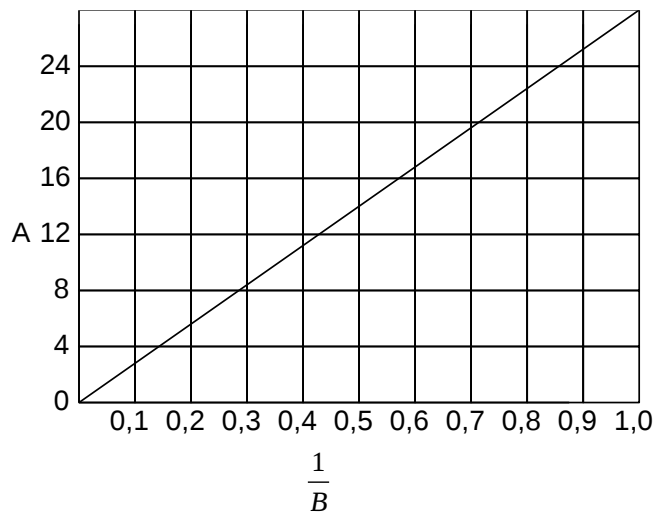
A	B	1/B	AB
1	24	0,0042	24
2	12	0,0083	24
3	8	0,125	24
4	6	0,167	24
6	4	0,250	24
8	3	0,333	24
12	2	0,500	24
24	1	1,000	24

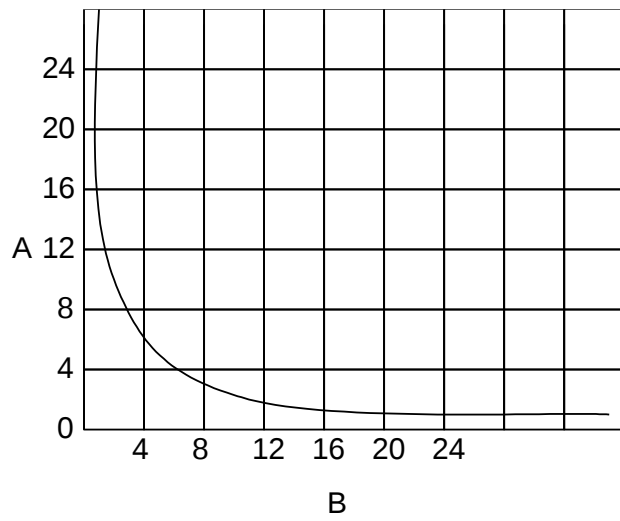
The two main features of **indirect proportions** are:

- (a) A graph of A over B gives a hyperbole while a graph of A over 1/B gives a straight line.
- (b) **AB = a constant.** Any value can be calculated by devding its corresponding value by the constant.

Indirect proportions can be illustrated symbolically:

$A \propto 1/B$, or $A = k/b$, with k as the constant.





9. **Conclusion** : Has to answer the investigative question and refer to all the variables.