KEY

Graphing Skills

Independent variable - recorded on the X-axis, most common one is time in physics.

Dependent variable - recorded on the Y-axis.

Linear graphs - shows a relation between Y and X variables, Y increases as a multiple of X.

Exponential graphs - shows a relation between Y and X variables, Y increases as a multiple of $X^{exponent}$.

The exponent is usually 2 (X^2).

Inverse graphs - show a relation between Y and X variables, Y increases as a multiple of 1 / X.

For linear graphs - slope shows the direct relationship between the Y and X variables.

For all graphs - Y-intercept shows the initial value of the dependant variable.

Plotting - putting dots on a graph.

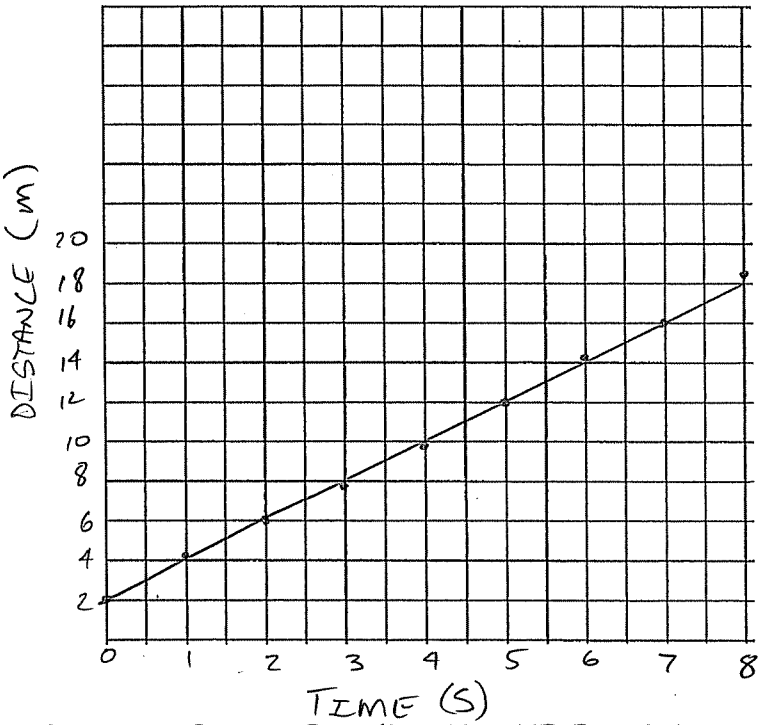
Graphing - drawing in the approximate curve that goes close to all data points (remember a line IS a type of a curve!)

When your graph is a line, expect to be finding the slope!

Part I

1.) Plot the following data:

Time (s)	Distance (m)
0	2.0
1	4.1
2	6.0
3	7.9
4	9.9
5	12.0
6	14.1
7	16.0
8	18.2



2.) Graph the data

WHEN GRAPHING THE DATA, DRAW A CURVE THAT GOES CLOSE TO (BUT NOT NECESSARILY THROUGH) ALL DATA POINTS. This is called 'the line of best fit' or curve fitting.

3.) Describe the relationship (between the Y-variable [distance] and the X-variable [time])

- LINEAR

4.) What is the slope? $\text{SLOPE} = \frac{y_2 - y_1}{x_2 - x}$ / $m = \frac{16 - 4.1}{7 - 1}$ / $m = \frac{12.1}{6} \approx 2.0$

5.) What are the units of the slope?

m/s

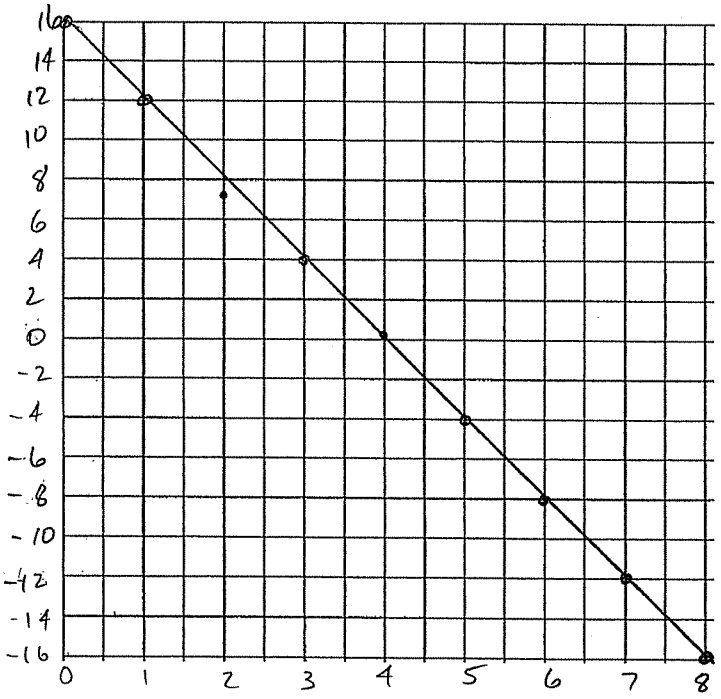
6.) What was the initial value?

2.0

Part II

1.) Plot the following data:

Time (s)	velocity (m/s)
0	16
1	12
2	7.2
3	4.0
4	- 0.1
5	- 4.0
6	- 8.0
7	- 12
8	- 16



2.) Graph the data.

3.) Describe the relationship (between the Y-variable [velocity] and the X-variable [time]).

- LINEAR (NEGATIVE)

4.) What is the slope?

$\text{SLOPE} = \frac{y_2 - y_1}{x_2 - x_1}$ / $m = \frac{-16 - 12}{8 - 1}$ / $m = \frac{-28}{7}$ / $m = -4$

5.) What are the units of the slope?

$\frac{M}{S^2}$

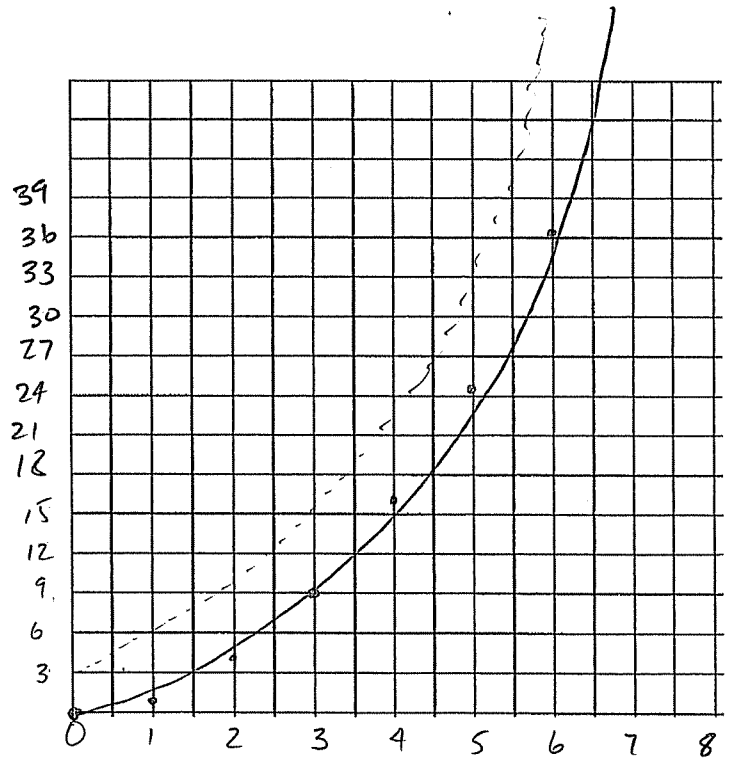
6.) What was the initial value?

16

Part III

1.) Plot the following data:

Time (s)	Distance (m)
0	0
1	1.0
2	4.1
3	9.0
4	16.2
5	24.8
6	36.3



2.) Graph the data.

3.) Describe the relationship (between the Y-variable [distance] and the X-variable [time]).

EXPONENTIAL

4.) What is the initial value?

0

5.) Determine an equation for the relationship, it should be of the form:

d = (constant number) $t^{(exponent)}$

$d = t^2$

6.) How would the graph look different if the equation were $d = t^2 + 3$?

- THE SAME JUST SHIFTED UP 3