Name **KEY**

Period _____

GRAPHING PRACTICE

For each data set below, determine the mathematical expression by: First, graphing the original data. Assume the 1st column in each set of values to be the independent variable and the 2nd column the dependent variable. Based on the shape of the first graph, modify the data so that the modified data will plot as a straight line. Using the slope and y-intercept of the straight-line graph, write an appropriate mathematical expression for the relationship between the variables. Be sure to include units!

Problem 1

V (m³)	$\frac{1}{V}$	P (pa)
0.1	10	40
0.5	2	8
1	1	4
2	0.5	2
4	0.25	1
5	0.2	0.8
8	0.13	0.5
10	0.1	0.4
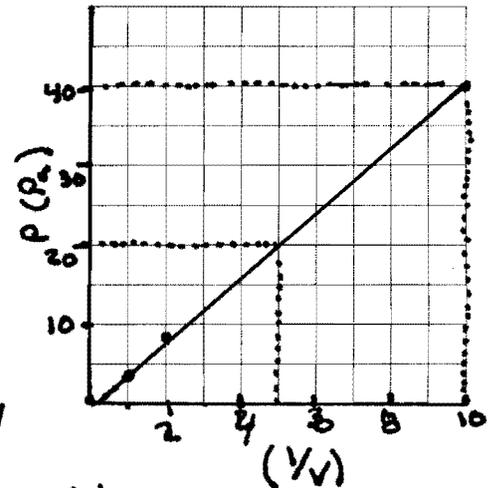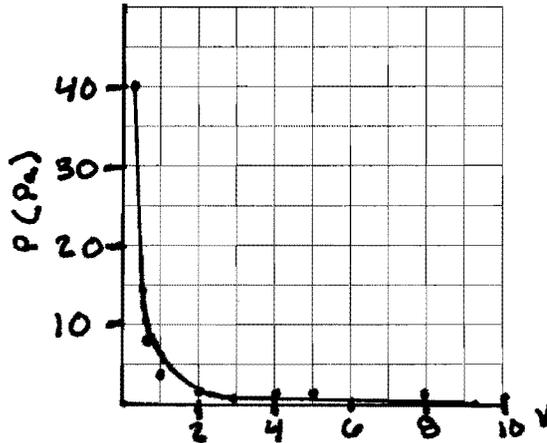
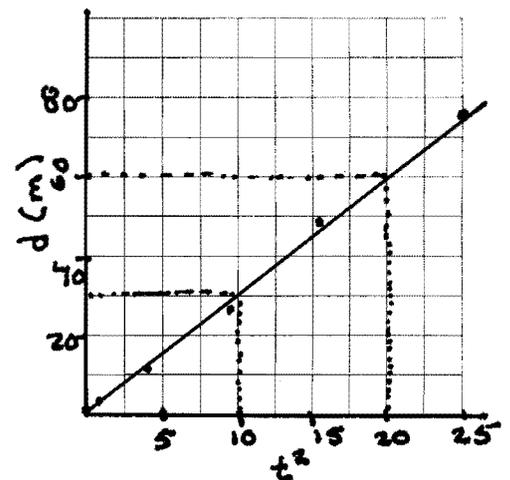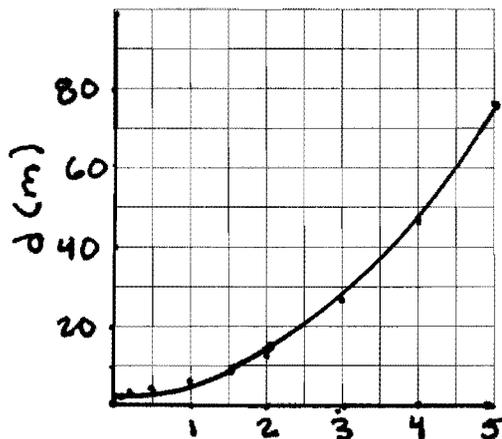What is the written relationship between volume and pressure?

PRESSURE IS INVERSLY Proportional to Volume

What is the mathematical relationship (equation) between volume and pressure?

$$m = \frac{\Delta P}{\Delta (1/V)} = \frac{40-20}{10-5} = \frac{20}{5} = 4.0 \qquad \boxed{P = \frac{4.0}{V}}$$

Problem 2

t (s)	t^2	d (m)
0.1	.01	0.03
0.2	.04	0.12
0.5	.25	0.75
1	1	3
2	4	12
3	9	27
4	16	48
5	25	75

What is the written relationship between time and distance?
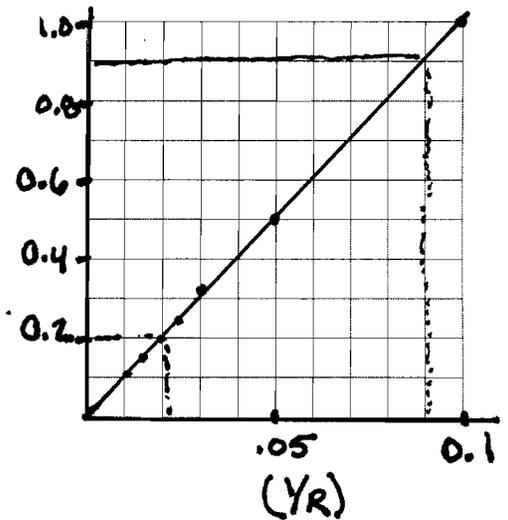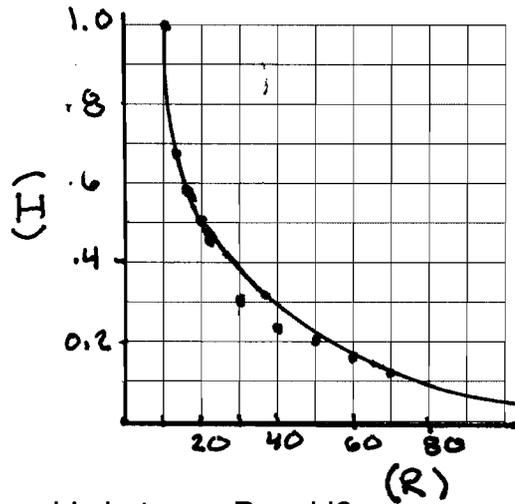
distance is directly Proportional to time Squared

What is the mathematical relationship (equation) between time and distance?

$$m = \frac{\Delta d}{\Delta t^2} = \frac{60-30}{20-10} = \frac{30}{10} = 3.0 \qquad \boxed{d = 3.0\, t^2}$$

Problem 3

R	$1/R$	I
10	.1	.98
20	.05	.51
30	.03	.32
40	.025	.26
50	.02	.2
60	.016	.17
70	.014	.14

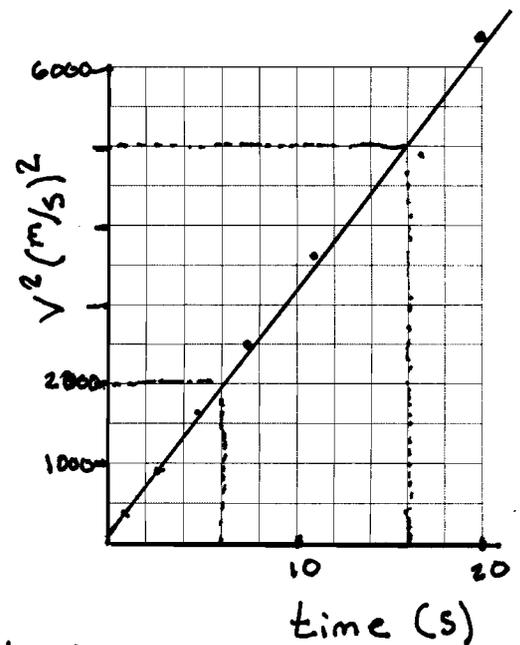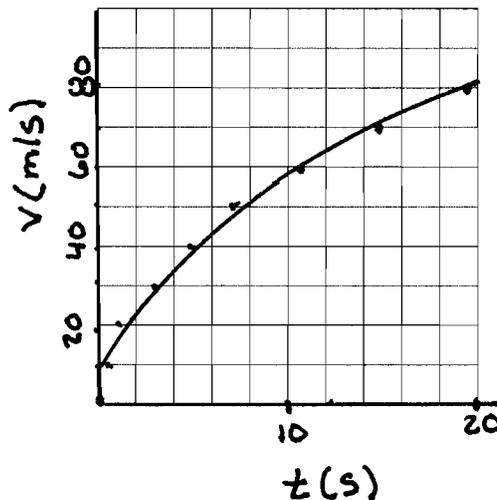What is the written relationship between R and I?

I is Inversly Proportional to R

What is the mathematical relationship (equation) between R and I?

$$m = \frac{\Delta I}{\Delta (1/R)} = \frac{.9 - .2}{9 - 2} = \frac{0.7}{7} = 10 \qquad I = 10\left(\frac{1}{R}\right) \qquad I = \frac{10}{R}$$

Problem 4

t (s)	V^2	V (m/s)
0.3	100	10
1.2	400	20
2.7	900	30
4.8	1600	40
7.5	2500	50
10.8	3600	60
14.7	4900	70
19.2	6400	80

What is the written relationship between time and Velocity?

Velocity Squared is directly Prop. to time

What is the mathematical relationship (equation) between time and velocity?

$$m = \frac{\Delta v^2}{\Delta t} = \frac{5000 - 2000}{16 - 6} = \frac{3000}{10} = 300$$

$$V^2 = 300\,t$$