Relationships Assignment | MFM1P

1. Fill In the blanks with the term that matches up the best with the description given. ⑧

scatter plot	correlation	positive	negative	strong
moderate	weak	dependent	independent	interpolate
extrapolate	outlier	line of best fit	curve of best fit	

_____a) This variable does not depend on another variable.

_____b) A data point that does not follow the pattern/trend.

_____c) You do this when you make a predication outside of the data collected.

_____d) The word that is used to describe when the data points fall towards the right.

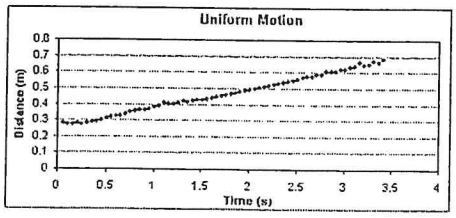
_____e) A word used to describe the strength of a scatter plot when almost all the points are close or on the line of best fit.

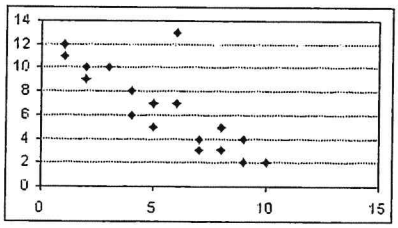
_____f) A graph that shows if there is a relationship between two variables.

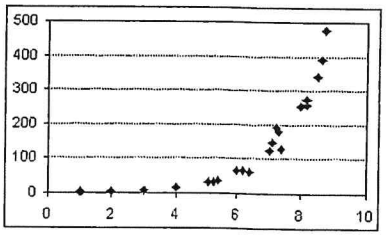
_____g) This variable is located on the vertical axis of a graph.

_____h) This is another term used for relationship.

2. a) Describe each of the **correlations** represented by the scatter plots below. Highlight your answers. ⑥







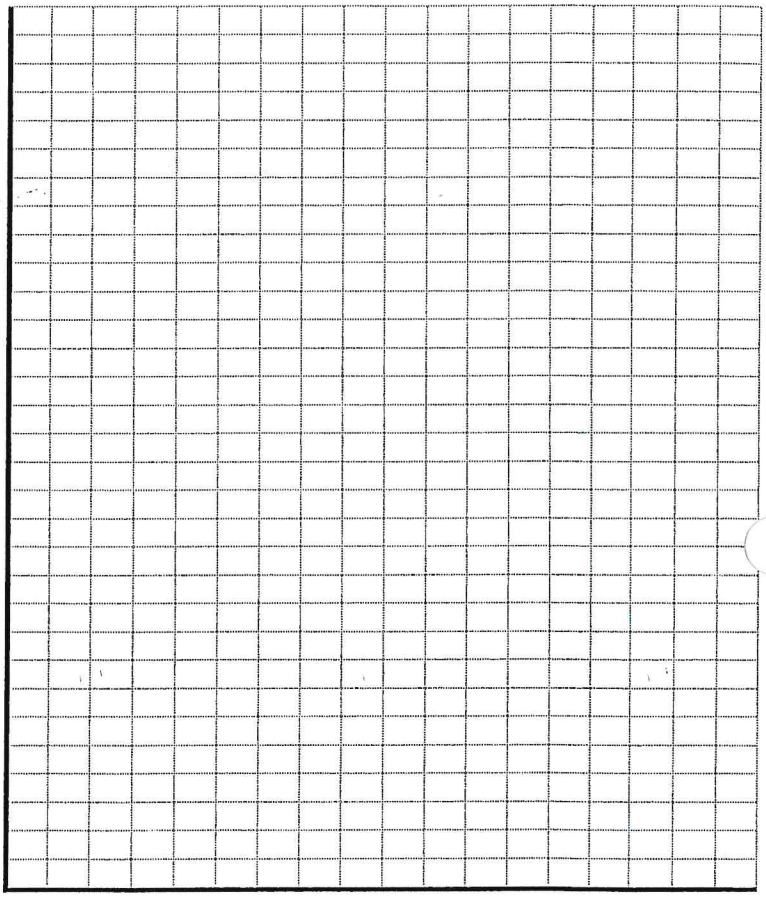
Relationship/No Relationship	Relationship/No Relationship	Relationship/No Relationship
Linear/Non-Linear	Linear/Non-Linear	Linear/Non-Linear
Positive/Negative	Positive/Negative	Positive/Negative
Strong/Moderate/Weak	Strong/Moderate/Weak	Strong/Moderate/Weak

b) One of the scatter plots above has an outlier. Identify the outlier by circling it. ①

3. You have been given a project for your science class. You grow a sunflower and track its growth over time. The purpose of your experiment is to examine the relationship between the length of time the sunflower has grown, and the height of the sunflower. Your experiment lasted 13 weeks and you watered your flower every other day and you took your measurements every Friday morning.

a) Create a scatter plot of your results. ⑤

Time (weeks)	Height (cm)
0	0
1	1
2	4
3	6
4	9
5	11
6	12
7	15
8	16
9	19
10	22
11	25
12	26
13	27



b) Describe the correlation:

Weak/Strong Positive/Negative Linear/Non-linear ①

c) Complete the following statement that describes the relationship:

As time increases, the height _____. ①

d) Draw a line of best fit. ①

e) **Use your line of best fit** to estimate the height of the sunflower after 7.5 weeks. _____ ②

*show your lines!

f) **Use your line of best fit** to estimate the number of weeks it would take for the sunflower to reach a height of 10 cm. _____ ②

*show your lines!

4. Two new drugs that are supposed to help with headaches are being studied. A varying dosage of the drug was given to 10 different people with a severe headache (pain rating of 10), and then they rated their pain afterwards on a scale from 0 to 10. The results are given below:

Drug A:

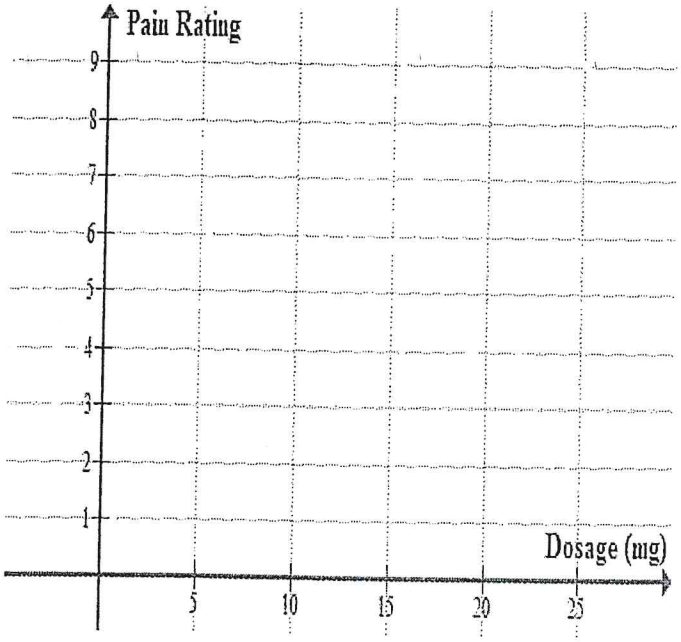
Dosage (mg)	5	25	20	10	10	5	15	25	15	20
Pain Rating	8	2	2	7	6	7	4	1	3	3

Drug B:

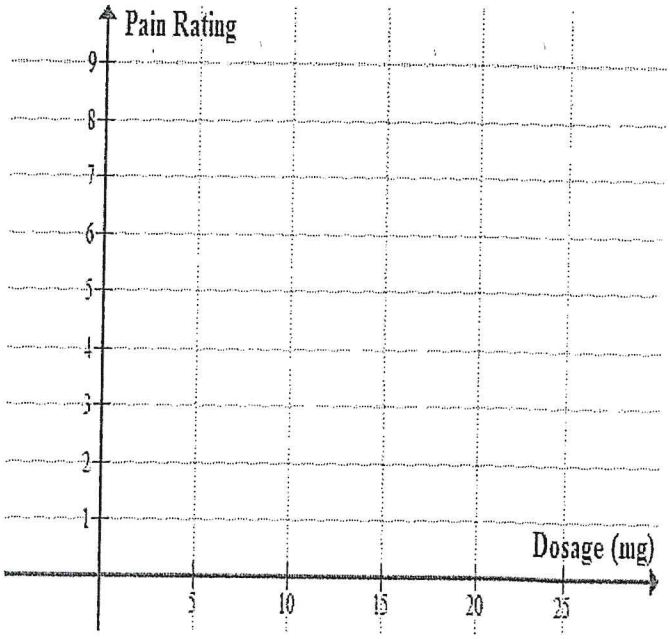
Dosage (mg)	10	15	25	15	20	5	5	10	20	25
Pain Rating	5	8	2	4	7	2	8	7	3	7

a) Make a scatter plot for each drug on the grids provided below. ②+②

Drug A:



Drug B:



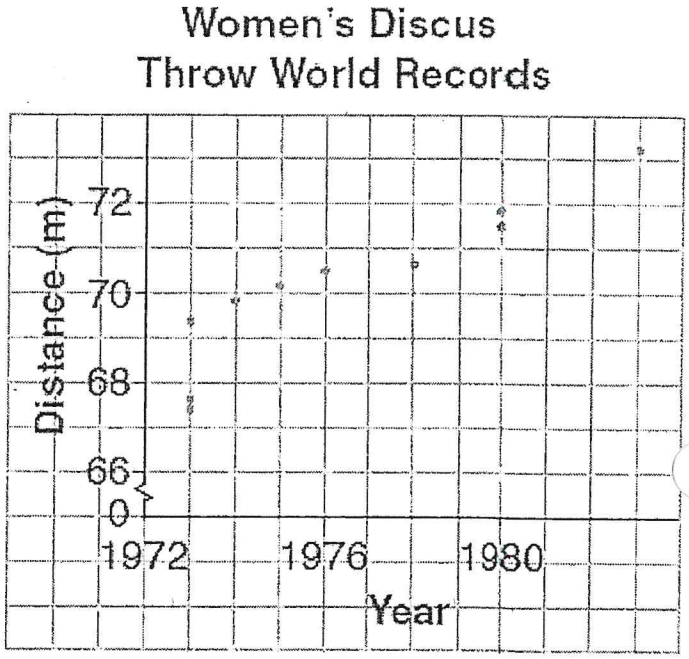
b) Which drug would you say works more consistently? Explain your answer. ②

5. The following scatterplot shows women's world record discus throws for various years.

a) What was the world record distance in 1976? ①

b) In what year was a record throw of 73.2m recorded? ①

c) Describe the correlation. ①



d) Describe the relationship. ①

e) Draw a line of best fit. ①

f) Using your line of best fit, estimate what the world record throw in 1984 might have been. ①
*Show your lines on the graph with a ruler.

g) Is what you did in f), interpolation or extrapolation? Explain how you know. ①

h) Do you think that this trend would continue beyond what the scatter plot shows? ①
*You must support your answer with a reason!

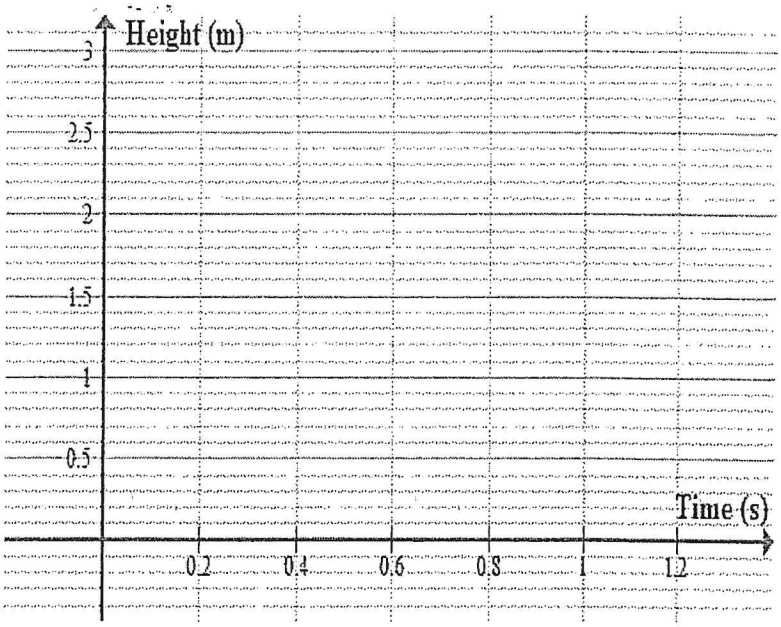
6. A baseball is thrown up into the air. Its height is measured every 0.2 seconds.

Time (s)	0	0.2	0.4	0.6	0.8	1.0	1.2
Height (m)	1.0	2.1	2.8	3.0	2.9	2.5	1.6

a) What is the independent variable? _____ ①

b) What is the dependent variable? _____ ①

c) Graph the data. ②



d) Draw a curve of best fit. ①

e) What is the greatest height that the baseball reaches? ①

f) Predict when the ball will hit the ground? ①

g) At what height was the baseball thrown? ①

h) At what times is the ball 2m above the ground? ②

i) Is what you did in h), interpolation or extrapolation? Explain how you know. ①