

Unit 3 Review

1. Answer the following questions using the graph provided.

a) What is the quantity on the x-axis?

Latitude

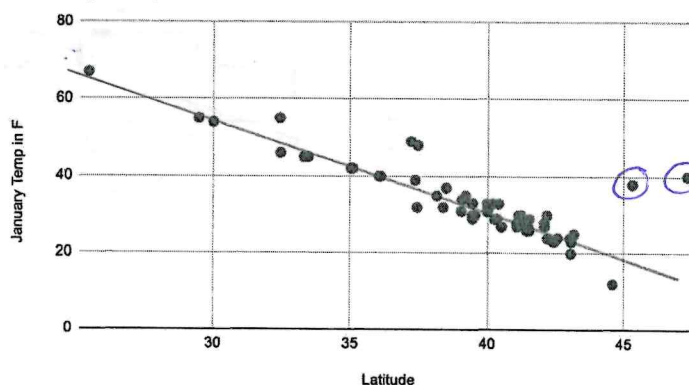
b) What is the quantity on the y-axis?

Temp in Jan. in °F.

c) State an approximate **value** for the correlation coefficient.

$$r = 0.75$$

January Temperature vs. Latitude



d) What does the point (30, 57) represent?

With a latitude of 30 the temperature in Jan. will be 57°F.

e) Identify an "outlier" point and write it as an ordered pair (x, y). What does this point represent? (45.5, 39)

That at a latitude of 45 the temperature in January would be 39°F.

f) Write a statement to summarize any conclusions you can make from this data.

As latitude increases the temperature in January decreases.

2. Find the mean, median and mode of the following data sets:

a) 5, 3, 2, 6, 5, 2, 5

$$\text{mean} = \frac{28}{7}$$

2, 2, 3, 5, 5, 5, 6
↑
median

$$\text{range} = 6 - 2 = 4$$

Mean = 4

Median = 5

Mode = 5

Range = 4

b) 14, 9, 20, 5, 17, 13

$$\text{mean} = \frac{78}{6}$$

5, 9, 13, 14, 17, 20
↑
median = $\frac{13+14}{2}$

$$\text{range} = 20 - 5$$

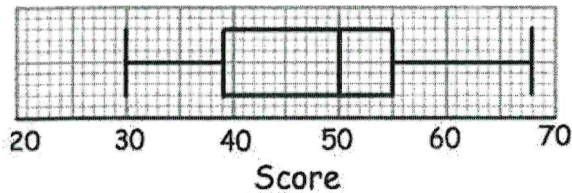
Mean = 13

Median = 13.5

Mode = no mode

Range = 15

3. For the box plot below, find the median (Q_2), Q_1 , Q_3 , IQR (interquartile range), min. and max.



$$Q_1 = 39$$

$$(Q_2) = 50$$

$$Q_3 = 55$$

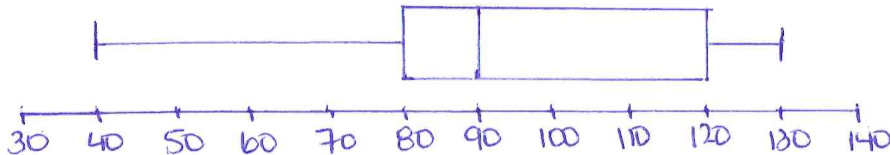
$$IQR = 55 - 39 = 16$$

$$\text{Min} = 30$$

$$\text{Max} = 68$$

4. Draw a box plot for the following data.

40, 80, 90, 90, 100, 120, 130



$$\text{min} = 40$$

$$Q_1 = 80$$

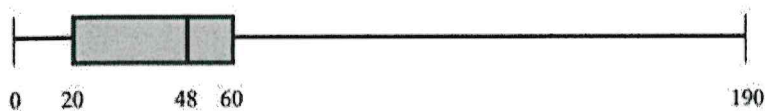
$$Q_2 = 90$$

$$Q_3 = 120$$

$$\text{max} = 130$$

5. The box plot below shows how much time was spent per night on homework for a certain class in high school in September.

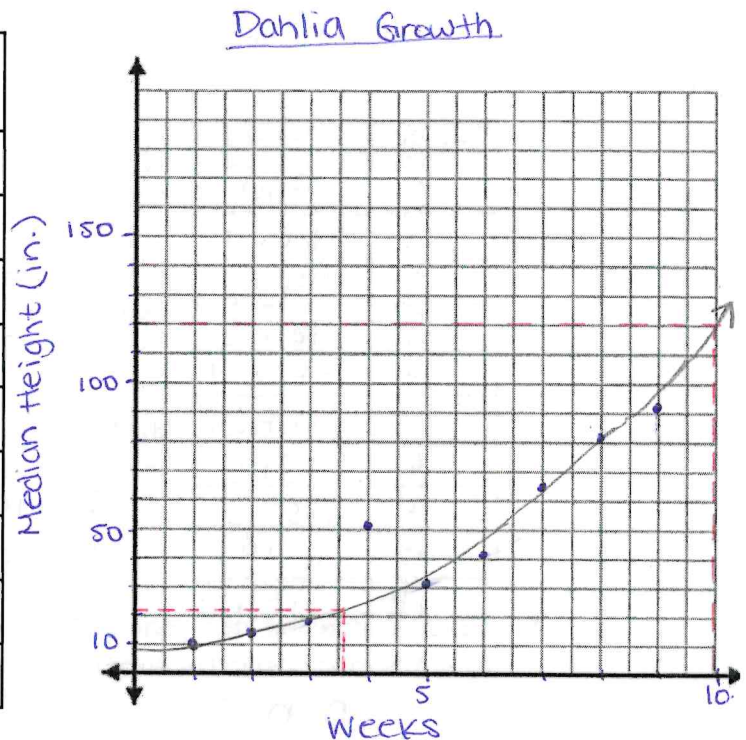
Average Minutes Per Night Spent On Homework



- a) What percent of students spent more than 60 minutes on homework per night?
25%
- b) What is the range of times that the middle 50% of students spend on homework per night?
60 - 20 minutes.
- c) How many students do not do homework? unknown.
- d) What percent of students spend less than 20 minutes per night on homework?
25%

6. The table below shows the results of an experiment for dahlia's grown in compost beds.

Weeks	Median Height in Compost bed (in.)
1	10.00
2	13.50
3	17.75
4	51.50
5	30.50
6	40.50
7	65.00
8	80.50
9	91.50



- What is the independent variable: WEEKS
- What is the dependent variable: median height in compost bed (in.)
- Graph the scatter plot.
- State any outlier point(s). (4, 51.50)
- Draw a **curve-of-best-fit** (removing any outliers).
- Is there a trend in the data? If yes, then describe the trend (strong/weak, positive/negative, linear/non-linear).
Strong, positive non-linear correlation.
- Estimate the median height of a dahlia after 10 weeks. Show your work on the graph. Did you interpolate or extrapolate?
The median height in the compost bed after 10 weeks is approximately 120 inches. This is extrapolation.
- Estimate the number of weeks it would take for the median height of the dahlia to be 21 inches. Show your work on the graph. Did you interpolate or extrapolate?
It would take approximately 3.5 weeks for the median height of the compost bed to be 21 inches. This is interpolation.

7. There are 900 students in a school at the start of the year. The number of students increases by 2.3% per month.
- a) Complete the table to show the number of students at the end of each month for 10 months.

Time (months)	# of Students
0	900
1	920.7
2	941.9
3	963.5
4	985.7
5	1008.4
6	1031.6
7	1055.3
8	1079.6
9	1104.3
10	1129.3

b) Is this an example of appreciation or depreciation? (circle one)

c) Write an equation to model the student population, P , after t months.

$$P = 900(1.023)^t$$

d) Use your equation to determine the number of students in the school after 12 months.

$$P = 900(1.023)^{12}$$

$$P = 1182.36$$

8. \$3200 is invested for 5 years at 3.5% simple interest annually.
- a) Is this relationship linear or nonlinear?

linear

b) Write an equation to represent the total amount in the account A , after n years.

$$A = 3200 + 3200(0.035)n$$

$$A = 3200 + 112.96n$$

c) How much is the investment worth at the end of 5 years?

$$A = 3200 + 112.96(5)$$

$$= 3764.80$$

\therefore The investment is worth \$3764.80 after 5 years.

d) How much interest was earned on the investment?

$$3764.80 - 3200 = 564.80$$

\therefore The interest earned was \$564.80.

9. Due to the current economic environment, your \$40,000 investment is depreciating at a rate of 15% annually.

a) Is this relationship linear or nonlinear?

non-linear

b) Write an equation to represent the total amount in the account A , after n years.

$$A = 40000(0.85)^n$$

c) How much will your investment be worth at the end of 3 years?

$$A = 40000(0.85)^3$$

$$= 24565$$

\therefore The investment is worth \$24565 after 3 years.

d) How much money have you lost in 3 years?

$$40000 - 24565 = 15435$$

\therefore In 3 years you have lost \$15435.

10. Hana starts with \$40 in her bank account and deposits \$20 each week. Jaydan starts with \$100 in his bank account and deposits \$10 each week.

a) Define your variables.

let A represent the amount in the bank account in \$
 let t " " the # of weeks

b) Write two equations to represent the total amount in the bank account at the end of each week.

Hana: $A_H = 20t + 40$

Jaydan: $A_J = 10t + 100$

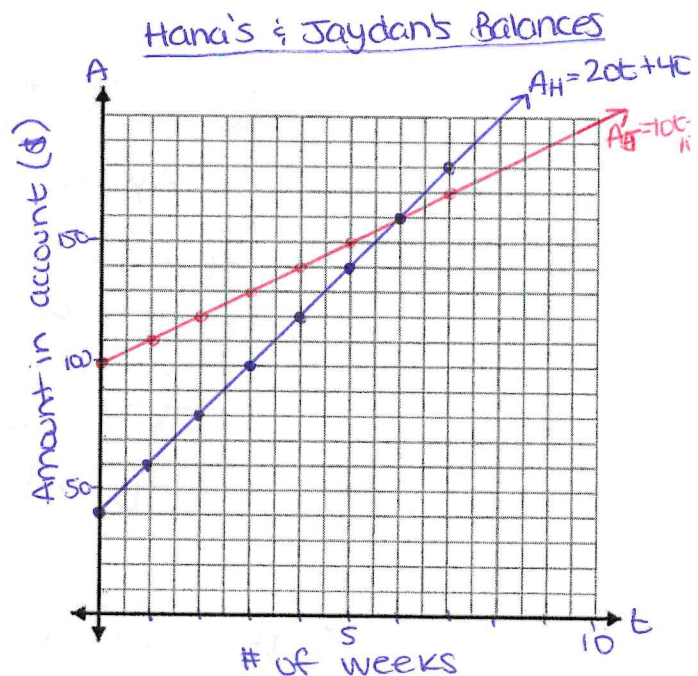
c) Use your equation to fill out a table of values and graph the two relations.

Hana:

t	A_H
0	40
1	60
2	80
3	100
4	120
5	140
6	160
7	180

Jaydan:

t	A_J
0	100
1	110
2	120
3	130
4	140
5	150
6	160
7	170



d) What is the solution to the system? What does it represent?

$(6, 160)$

Hana and Jaydan both have \$160 in their accounts after 6 weeks.

e) If they both were saving up to buy a new Nintendo Switch that costs \$400, who would have enough money to purchase it first?

$$A_H = 20t + 40$$

$$400 = 20t + 40$$

$$400 - 40 = 20t$$

$$\frac{360}{20} = \frac{20t}{20}$$

$$t = 18$$

$$A_J = 10t + 100$$

$$400 = 10t + 100$$

$$400 - 100 = 10t$$

$$\frac{300}{10} = \frac{10t}{10}$$

$$t = 30$$

\therefore Hana would have enough money first.

11. Your school is donating items to the local food pantry. Your homeroom is having a competition to see who will donate the most items. You have already donated 14 items and plan to donate 3 more each week. Your friend has already collected 8 items and plans to collect 5 more items each week. How many weeks will it take for both of you to have collected the same amount? How much will each of you have collected at that time?

a) Define your variables.

let A represent the total amount of items donated
let t " the # of weeks.

b) Write an equation to represent the total number of items collected.

You: $A_y = 3t + 14$

Your Friend: $A_f = 5t + 8$

c) Use your equation to algebraically solve for when you both have collected the same amount of items.

$$A_y = A_f$$

$$3t + 14 = 5t + 8$$

$$3t - 5t = 8 - 14$$

$$\frac{-2t}{-2} = \frac{-6}{-2}$$

$$\boxed{t = 3}$$

$$A_y = 3t + 14$$

$$A_y = 3(3) + 14$$

$$= 9 + 14$$

$$\boxed{A_y = 23}$$

$$(3, 23)$$

\therefore It will take 3 weeks for both of us to collect 23 items.