Unit 3: Two-Variable Data

Interpreting Graphs

Learning Goals
- **review different types of graphs**

Stem & Leaf Plots

Stem & Leaf Plots

Example: The marks for a Grade 12 College Math exam were as follows:
74, 67, 83, 56, 50, 76, 82, 61, 93, 50, 58, 66, 80, 86, 75, 93, 84, 80
Organize this data into a Stem and Leaf Plot

10s ↓ 1s ↓

STEM	LEAF
5	0, 0, 6, 8
6	1, 6, 7
7	4, 5, 6
8	0, 0, 2, 3, 4, 6
9	3, 3

Frequency Table

Example: Do a poll of the students in MAP 4C's favourite fast food. Organize the data into the following frequency table

Fav Food	Tally	Frequency
Pizza	~~IIII~~	5
Sub	I	1
Burger	II	2
Salad	I	1
Pasta	II	2
Hot Dog		Ø

Class Interval Frequency Table

Sometimes, data is continuous in nature and so must be organized into intervals t analyzed.

Continuous Data: Data values may be decimals.

Example: Collect the heights of the students in your class and organize them intc class interval frequency table.

Interval	Tally	Frequency
150 - 159		
160 - 169	III	3
170 - 179	II	2
180 - 189	II	2
190 - 199	I	1

Circle Graph (Pie Chart)

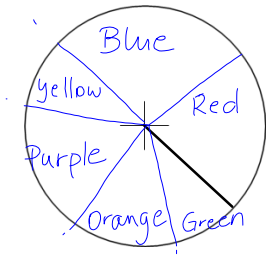
- Circle divided into sectors whose areas are proportional to quantities represented.
- Central Angle is the measure of proportion in a circle graph.

Central Angle = 360° x percent of data

Disadvantages:
- If there are too many data points the graph is messy and confusing.
- Gives no actual values and frequency is lost.

Example: Using the following data on favorite colours, find the central angle and then create a circle graph of the data.

Colour	Frequency	Central Angle
Red	5	$\frac{5}{22} \times 360° = 82°$
Blue	6	$\frac{6}{22}(360) = 98°$
Yellow	2	33°
Purple	4	65°
Orange	3	49°
Green	2	33°
Total	22	360°

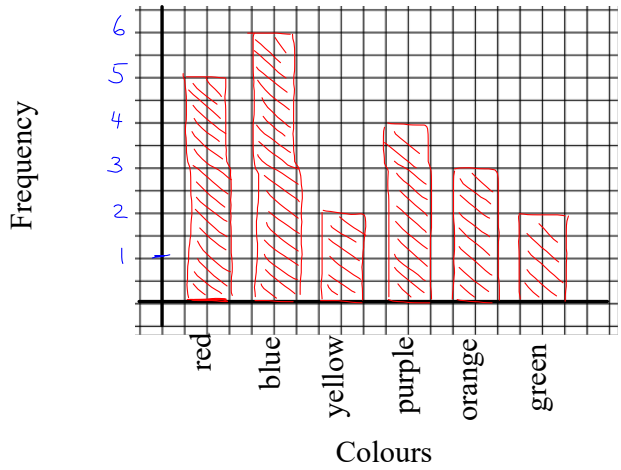


Bar Graph

- Must include: a title, description on each axis, height of the bars are readable from graph, spacing between bars.

Disadvantages:
- Can only be used to represent 1 variable.
- Depending on horizontal axis scale, relative frequency can be misleading.

Example: Use the frequency table above for favourite ~~fast food~~ colours in your class and display this data in a bar chart.



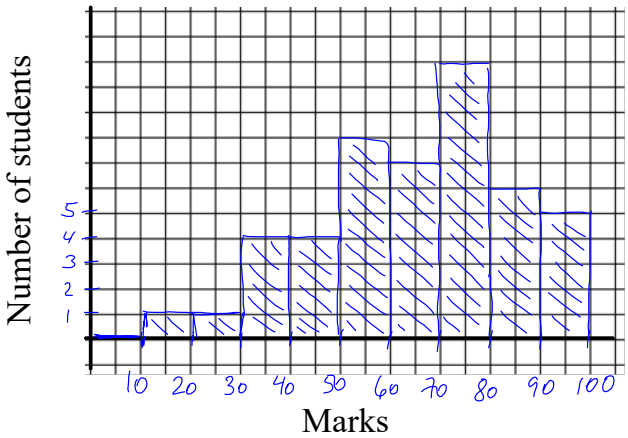
Histogram

- Similar to a bar graph.
- Horizontal axis is divided into equal intervals or bins.
- Intervals or bins must be constant.
- Must include: Title, description on axes, no spaces between bars

Disadvantages: Specific data points are lost due to intervals.

Example: Using the frequency table below, create a histogram to display this data.

Marks	Number of Students
0-10	0
10-20	1
20-30	1
30-40	4
40-50	4
50-60	8
60-70	7
70-80	11
80-90	6
90-100	5



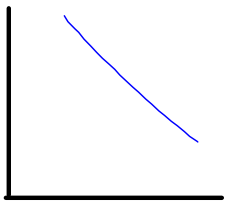
Slope and Line Graphs

What is slope?

Slope is the rate of the change of a straight line.

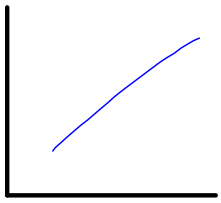
Negative Slope

-Goes down to the right



Positive Slope

-Goes up to the right



The Equation of a Line

$$y = mx + b$$

m is the slope

$m = \frac{\text{rise}}{\text{run}}$

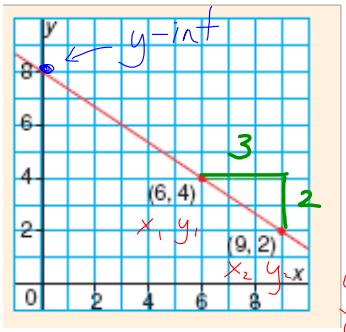
$= \frac{y_2 - y_1}{x_2 - x_1}$

b is the y-intercept

where the line crosses the y-axis

The Equation of a Line

Find the equation of the line shown below:



First choose two points and find the slope:

$m = \frac{\text{rise}}{\text{run}}$

$= \frac{-2}{3}$

graph is going down

$m = \frac{y_2 - y_1}{x_2 - x_1}$

$= \frac{2 - 4}{9 - 6}$

$= \frac{-2}{3}$

Then sub in the slope and one point into $y = mx + b$ to find the y-intercept:

$y = mx + b$

$4 = \left(\frac{-2}{3}\right)(6) + b$

any point on the line

$4 = \frac{-12}{3} + b$

$4 + \frac{12}{3} = b$

$4 + 4 = b$

$8 = b$

Therefore, the equation of the line is:

$y = \frac{-2}{3}x + 8$

Seatwork

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