

Worksheet 2015-8EJ-00001(1)

(1) Determine the median, mode and mean in each of the following sets of data:

(a) $\check{1}; \check{2}; \check{2}; \check{4}; \check{2}; \check{3}; \check{4}; \check{1}; \check{3}; \check{4}; \check{5}; \check{3}; \check{1}; \check{1}; \check{1}$

Arranged: $1; 1; 1; 1; 1; 2; 2; 2; 3; 3; 3; 4; 4; 4; 5$

$$\text{Mode} = 1$$

$$\text{Median} = 2 \text{ (8th tally)}$$

$$\text{Mean} = \frac{37}{15}$$

$$\text{Mean} \approx 2.47$$

(b) $\check{112}; \check{112}; \check{121}; \check{117}; \check{113}; \check{112}; \check{117}; \check{120}; \check{117}; \check{119}$

$112; 112; 112; 113; 117; 117; 117; 119; 120; 121$

$$\text{Mode} = 112 \text{ and } 117$$

$$\text{Median} = \frac{117 + 117}{2} = 117$$

$$\text{Mean} = \frac{1160}{10} = 116$$

(2) The mean of the following set of data is 56. Calculate the value of x .

47 49 51 51 63 85 x 54

$$\text{Mean} = \frac{47 + 49 + 51 + 51 + 63 + 85 + x + 54}{8}$$

$$56 = \frac{400 + x}{8}$$

$$56 \times 8 = 400 + x$$

$$\therefore x + 400 = 448$$

$$x = 448 - 400$$

$$\therefore x = 48$$

- (3) The number of points scored per game, for all the rugby teams in the school for the league is as follow:

12 34 21 7 3 18 23 5 21 15 34 12 43 26 67 23
 19 27 9 34 13 34 43 54 13 15 26 44 13 3 0 24
 26 29 33 21 12 24 45 61

- (a) Complete a frequency table by using the following classes:

0 - 9 ; 10 - 19 ; 20 - 29 ; 30 - 39 ; 40 - 49 ; 50 - 59 ; 60 - 69

Class	0 - 9	10 - 19	20 - 29	30 - 39	40 - 49	50 - 59	60 - 69
Tally							
Frequency	6	10	12	5	4	1	2
Class - midpoint	4,5	14,5	24,5	34,5	44,5	54,5	64,5

- (b) Determine the class midpoint for each class interval.

Ex. $(0-9) \rightarrow \frac{0+9}{2} = \frac{9}{2} = 4,5$

$(10-19) \rightarrow \frac{10+19}{2} = \frac{29}{2} = 14,5$ etc.

- (c) Determine the modal class for the data.

$(20-29) \rightarrow 12$

- (d) In which class will the median lie?

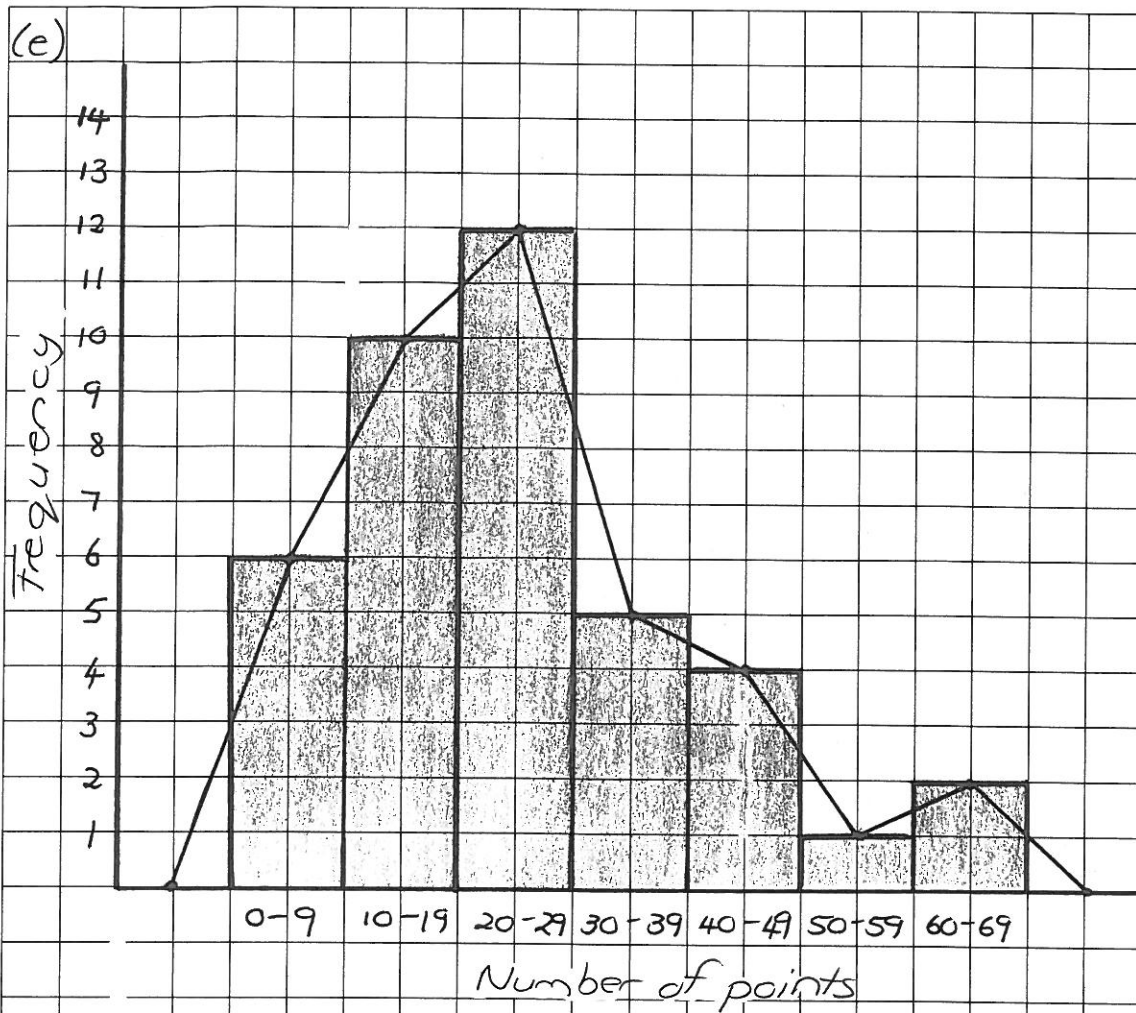
Median between T_{20} and $T_{21} \therefore$ In class (20-29)

- (e) Draw a histogram for the data by using the class intervals as in (a).

Also draw a frequency polygon on the same graph as the histogram.

(Use the graph paper.)

(3) (e)



- (4) The annual budget always delivers a few unexpected surprises! The table below indicates some of the allocations for certain departments (amounts given to the nearest billion rand!) for the 2010 book year:

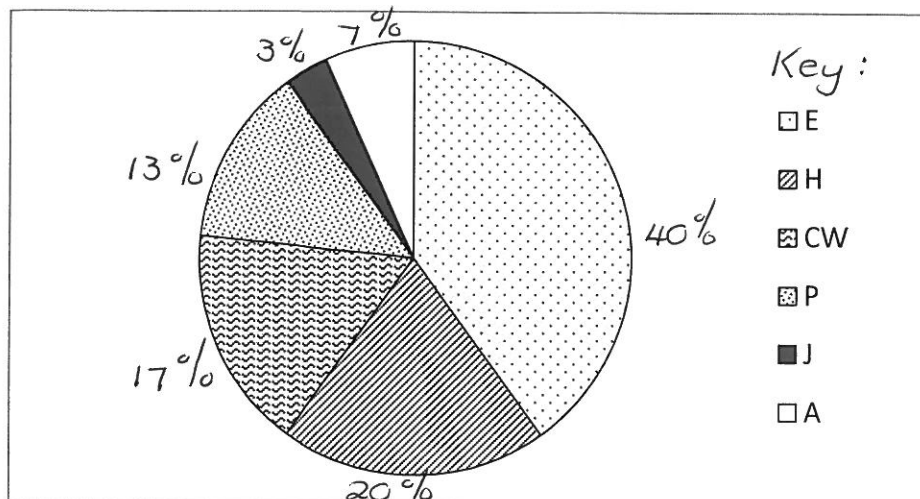
Department:	Allocation:
Education (E)	48
Health (H)	24
Community safety and welfare (CW)	20
Police (P)	16
Justice (J)	4
Agriculture (A)	8

Total : 120

- (a) Present the above table as a pie chart. Also indicate the percentage allocations for each department on the diagram. Give a clear key!

$$\begin{aligned}
 E &: \frac{48}{120} \times \frac{360^\circ}{1} = 144^\circ \rightarrow \frac{48}{120} \times \frac{100}{1} = 40\% \\
 H &: \frac{24}{120} \times \frac{360^\circ}{1} = 72^\circ \rightarrow \frac{24}{120} \times \frac{100}{1} = 20\% \\
 CW &: \frac{20}{120} \times \frac{360^\circ}{1} = 60^\circ \rightarrow \frac{20}{120} \times \frac{100}{1} = 17\% (16,6) \\
 P &: \frac{16}{120} \times \frac{360^\circ}{1} = 48^\circ \rightarrow \frac{16}{120} \times \frac{100}{1} = 13\% (13,3) \\
 J &: \frac{4}{120} \times \frac{360^\circ}{1} = 12^\circ \rightarrow \frac{4}{120} \times \frac{100}{1} = 3\% (3,3) \\
 A &: \frac{8}{120} \times \frac{360^\circ}{1} = 24^\circ \rightarrow \frac{8}{120} \times \frac{100}{1} = 7\% (6,6) \\
 \text{Total:} & \quad 360^\circ \quad 100\%
 \end{aligned}$$

Annual budget (2010)



(b) Which department has the highest allocation?

Education

(c) If the minister of Finance assures the Department of Education that their annual allocation will each year increase with at least 10%, calculate the minimum allocation for the Department of Education for the 2011 book year.

$$\begin{aligned} 2011 &: 110\% \text{ of } R48 \text{ billion} \\ &= R52,8 \text{ billion} \end{aligned}$$

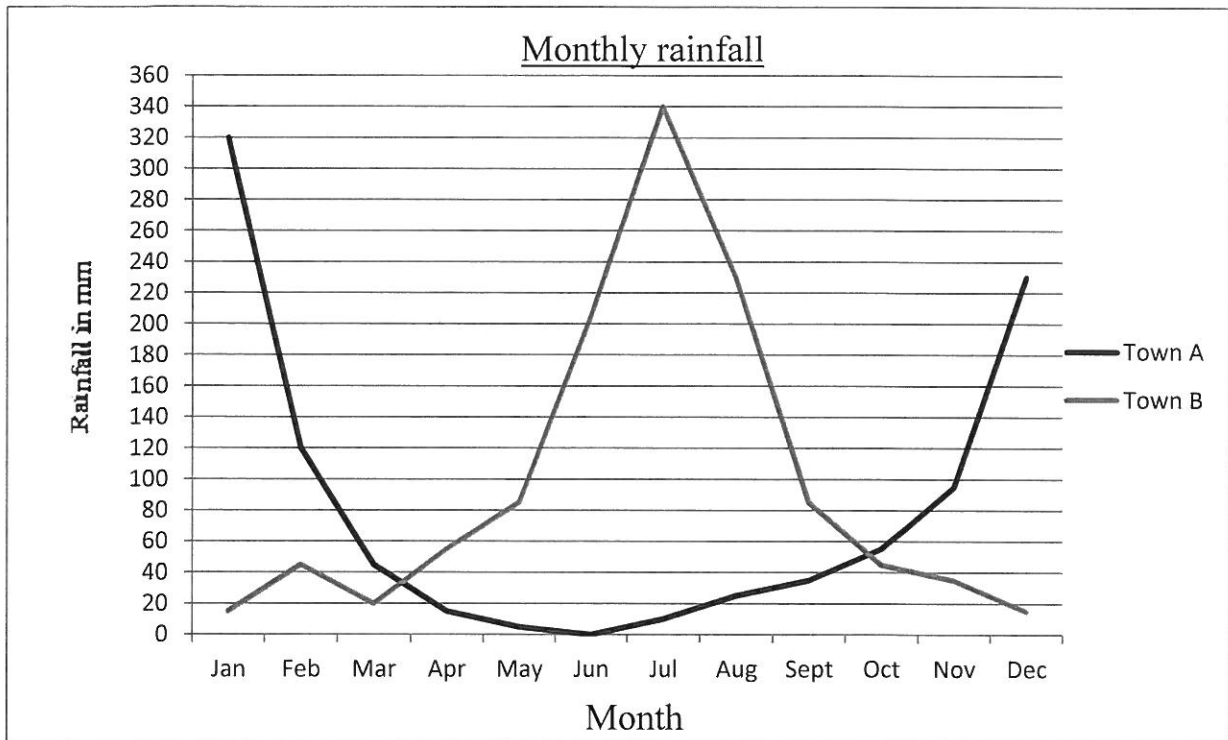
(d) Which percentage of the budget, as in the table, is allocated to the Department of Health?

$$H : \frac{24}{120} \times \frac{100}{1} = 20\%$$

(e) Determine the ratio between the amount allocated to the Police Department and the amount allocated to the Department of Justice.

$$\begin{aligned} \frac{P}{J} &= \frac{16}{4} \div \frac{4}{4} \\ &= \frac{4}{1} \\ &= 4:1 \end{aligned}$$

- (5) The following graph shows the average monthly rainfall for two towns. Consider the graph and answer the questions below.



- (a) Between which months does the rainfall of Town A shows an increase?

Jun → Dec

- (b) Between which months does the rainfall of Town B shows a decrease?

Feb → March and Jul → Dec

- (c) Calculate the average rainfall for Town A for the first six months of the year.
If necessary, round off to the nearest integer.

$$\text{Jan} - \text{Jun} : 320 + 120 + 42 + 16 + 2 + 0 = 500 \text{ mm}$$

$$\therefore \text{Average rainfall} = \frac{500}{6}$$

$$\approx 83 \text{ mm}$$

- (d) Is Town B a winter rainfall area or a summer rainfall area? Motivate.

Winter rainfall area

- (e) If one inch is equal to 25 mm, calculate how many inches of rain fell in Town B during the month of July.

$$\text{Jul} = 340 \text{ mm} = \frac{340}{25} \text{ inches}$$

$$= 13,6 \text{ inches}$$