CHAPTER NINE
PIE CHART

PIE CHART:

(Q1) In a classroom, there are 10 students. Three study Maths, five study physics and two study geography .Represent this on a pie chart.

Solution

Total number of students = 10.

For Maths:

Number of those who study Maths = 3.

=> The angle representing those who study Maths $= \frac{3}{10} \times 360$

$=108^{0.}$

For Physics:

Number of those who study physics = 5.

=>The angle representing those who study physics

$= 180^{0..}$

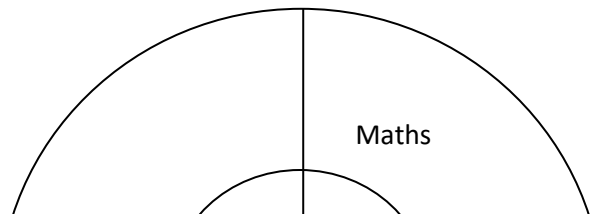
For Geography:

Number of those who study geography = 2 .

=>Angle representing geography students $= \frac{2}{10} \times 360 = 72^{0}$.

N/B: All the calculated angles when added together must be equal to $360^{0.}$

=> $108^{0}+180^{0}+72^{0} = 360^{0}$



N/B: The pie chart must be drawn accurately, using a protractor.

(Q2) During a school party, 40 students took in Banku, 60 took in rice, 30 took in cassava and 50 took in Tuo. Represent this on a pie chart.

Solution

Total number of students = 40 +30 + 50 + 60 =180^0.

Banku:

Number of students who ate Banku = 40

=>The angle representing those who took in Banku =

$\frac{40}{180} \times 360^0 = 80^0$

Rice:

Number of students who ate rice = 60.

=>The angle which represents those who took in rice =

$\frac{60}{180} \times 360^0 = 120^0$

Cassava:

The number of those who took in cassava= 30.

=> The angle representing those who took in cassava =

$\frac{30}{180} \times 360^0 = 60^0$.

Tuo:

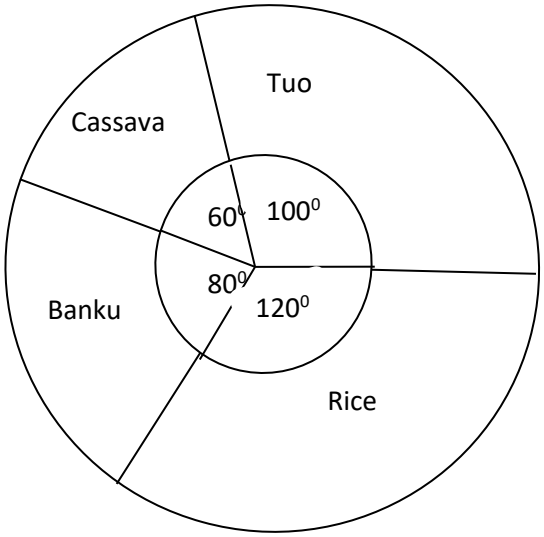
The number of those who took in Tuo = 50.

=> The angle representing those who took in Tuo=

$\frac{50}{180} \times 360^0 = 100^0$

N/B: As already stated, the sum of all the angles calculated must be equal to $360^0$and if this is not so, then there is a mistake somewhere.

i.e. $100^0 + 60^0 + 120^0 + 80^0 = 360^0$



(Q3)

District	**Production/tones**
Bibiani	600
Nkawkaw	900
Wiaso	1800
Ahafo	1500
Agona	2400

The given table shows the production of timber in five districts in Ghana, for a certain year.

(a) Draw a pie chart to represent this information.
(b) What percentage of timber production was from Nkawkaw

Solution

(a) Total production = 600 + 900 + 1800 + 1500 + 2400 =7200t.

Bibiani:

Production from Bibiani = 600t .

Angle representing this production

$= \frac{600}{7200} \times 360^0 = 30^0$.

Nkawkaw:

Production from Nkawkaw = 900t.

Angle which represents this production

$= \frac{900}{7200} \times 360^0 = 45^0$

Wiaso:

Production from Wiaso = 1800t

Angle representing this production

$= \frac{1800}{7200} \times 360 = 90^0$.

Ahafo:

Production from Ahafo = 1800t.

Angle representing this production

$= \frac{1800}{7200} \times 360 = 75^0$.

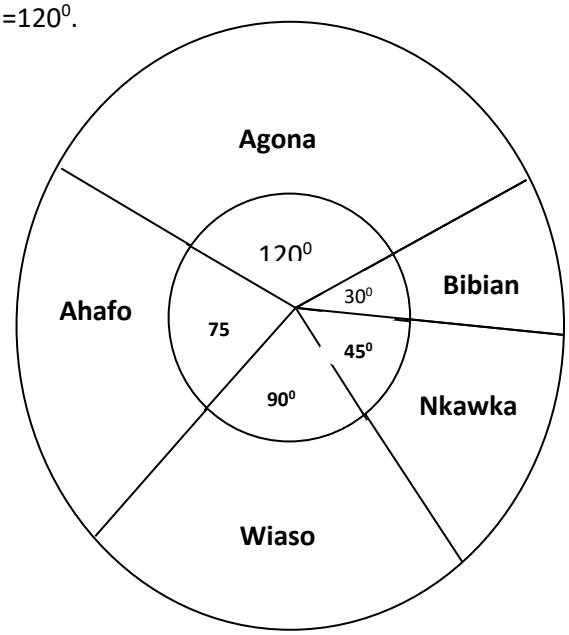
Agona:

Production = 2400t.

Angle representing this production

$= \frac{2400}{7200} \times 360^0$

$=120^0$.



Percentage of production from Nkawkaw

$= \frac{900}{7200} \times 100 = 12.5\%$

(Q4)

Agric	30%
Power	20%
Transport	x %
Entertainment	40%

The table shows the percentage allocation of funds for the welfare of a village.

(a) Illustrate this information on a pie chart.
(b) If the total amount allocated was ¢4000, determine the allocation for power and transport.

N/B: Since we are dealing with percentage, then the total is 100 .

=>We must first determine the value of x.

Solution

Since the total = 100.

$=>30^0+20^0+x^0+40^0=100,$

$=> \ 90^0+ x^0 = 100^0$

=> x =10%.

Agric:

Angle representing Agric.

$= \frac{30}{100} \times 360^0 = 108^0$.

Power:

Angle representing power

$= \frac{20}{100} \times 360 = 72^0$.

Transport:

Angle representing transport

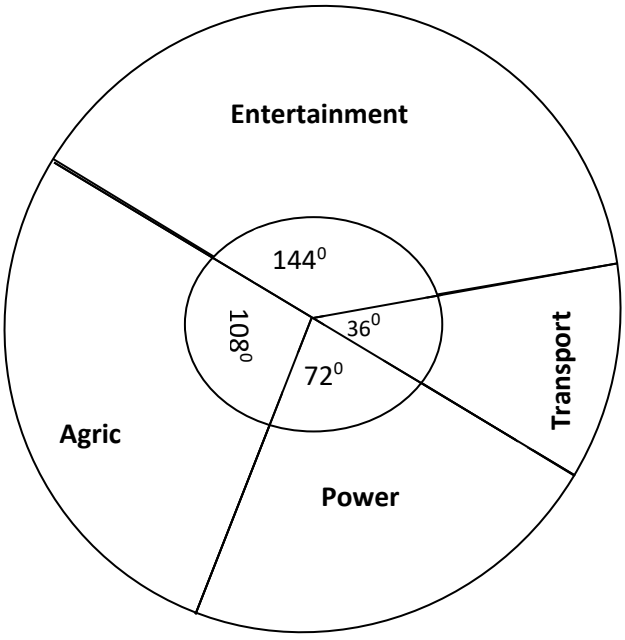
$= \frac{x}{100} \times 360 = \frac{10}{100} \times 360 = 36,^0$ since x = 10%.

Entertainment:

Angle representing entertainment

$= \frac{40}{100} \times 360 = 144^0$

(a)



(c) Total amount allocated =¢4000.

Allocation for power = 20% of 4000

$= \frac{20}{100} \times 4000$ = ¢800

(Q 5) Last term, Adwoa Mansah spent 25% of her pocket money on books, 30% on food, 20% on drinks and the rest on entertainment.

(a) Represent this on a pie chart.

(b) If her pocket money for the term was ¢1000, how much did she spend on entertainment.

Solution

Let x% = the percentage of the amount spent on entertainment.

Since the total = 100,

=> 25+30+20+x =100

=>75+ x =100,

=> x = 100-75

=> x =25

Books:

Angle representing the amount spent on books = $\frac{25}{100} \times 360 = 90^0$

Food:

Angle representing the amount spent on food

$= \frac{30}{100} \times 360$ = 108^0.

Drinks:

Angle representing the amount spent on drinks

$= \frac{20}{100} \times 360$

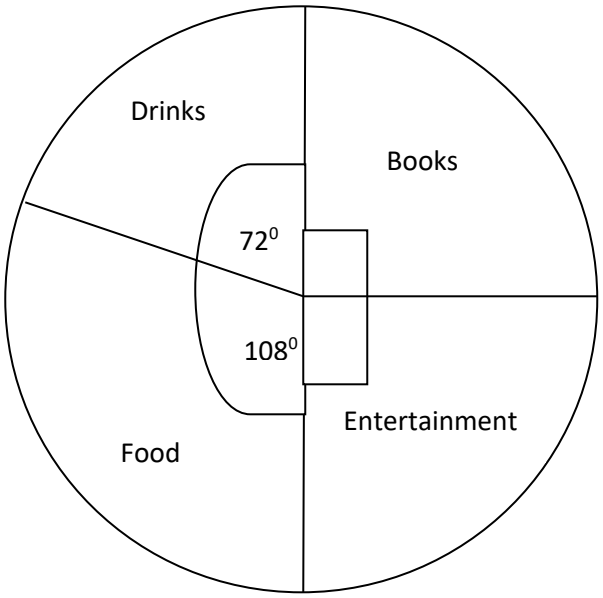
= 72^0.

Entertainment:

Angle representing the amount spent on entertainment

$= \frac{x}{100} \times 360$

$= \frac{25}{100} \times 360 = 90^0.$



(b)Pocket money for the term = ¢1000.

Amount spent on entertainment

= 25% of ¢ 1000

$= \frac{25}{100} \times 1000 = ¢250.$

(Q6) The 36 teachers who teach in a certain school have been classified as:

Graduates ……..6

Diplomates……..10

Specialists……..8

Trained teachers …….x

Represent this on a pie chart.

Solution

Since the total number of teachers = 36,

then 6 + 10 + 8+ x = 36,

=> 24 + x = 36

=> x = 12.

The number of trained teachers = 12.

Graduates:

Number of graduates = 6.

Angle representing this = $\frac{6}{36} \times 360 = 60^0$.

Diplomates:

Number of Diplomates = 10.

Angle representing this = $\frac{10}{36} \times 360 = 100^0$.

Specialists:

Number of specialists = 8.

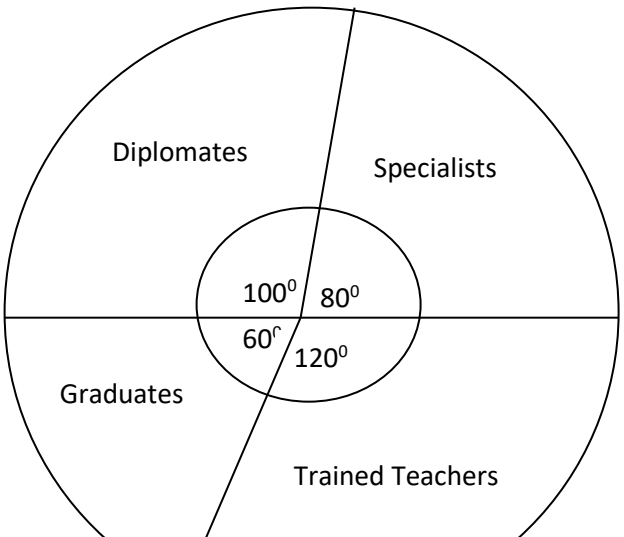
Angle representing this = $\frac{8}{36} \times 360 = 80^0$.

Trained teachers:

Number of trained teachers = 12.

Angle representing this = $\frac{12}{36} \times 360$

= 120.



(Q 7) A class teacher determined the local languages spoken by the 18 students in her class, as well as the number of students who spoke each language, and came out with the following:

Fanti……..4

Twi……2

Ewe……7

Gonja……y

(a) Represent this on a pie chart.

(b) Determine the percentage of the students, who speak Fanti.

Solution

Since the number of students under consideration = 18,

then 4+2+7+ y =18, =>13+ y = 18, => y =18-13 = 5.

The number of those who spoke Gonja = 5.

Fanti:

Number of those who spoke Fanti = 4.

The angle which represents this = $\frac{4}{18} \times 360$ = 80^0.

Twi:

Number of those who spoke Twi = 2.

Angle representing this = $\frac{2}{18} \times 360$ = 40^0.

Ewe:

Number of those who spoke Ewe = 7.

Angle representing this = $\frac{7}{18} \times 360$ = 140^0.

Ewe:

Number of those who spoke Ewe = 7.

Angle representing this = $\frac{7}{18} \times 360$ = 140^0.

Gonja:

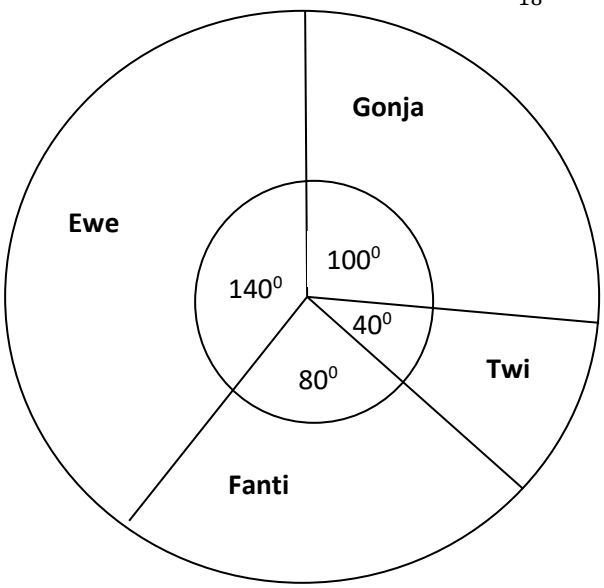
Number of those who spoke Gonja = 5.

Angle representing this = $\frac{5}{18} \times 360$= 100^0.

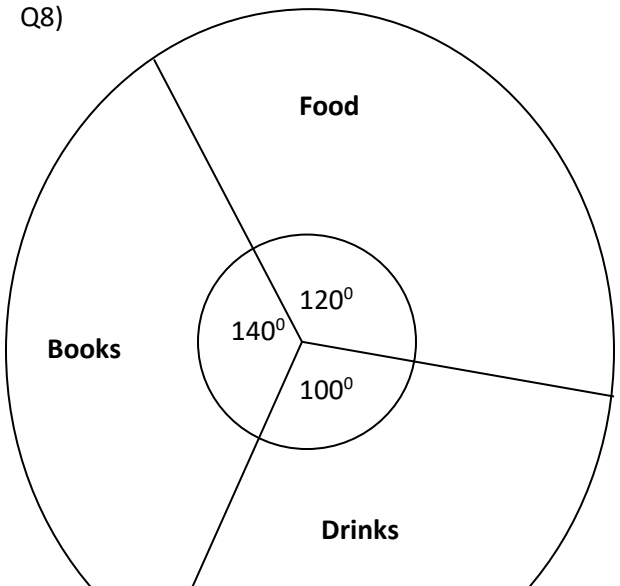
(b)Total number of students under consideration = 18.

Number of those who spoke Fanti = 4.

Percentage of those who spoke Fanti = $\frac{4}{18} \times 100$ = 22.2 %.



Q8)



The pie chart shows the amount spent by a student, during a school term. If he spent ¢ 200 on food, determine the total amount the student spent.

N/B –The total amount spent = amount spent on drinks + amount spent on food + amount spent on books.

Also the amount spent is proportional to the angle which represents it.

Solution

Angle representing the amount spent on food = 120^0

Amount spent on food = ¢200

$=>120^0$= ¢200

Drinks:

Angle representing the amount spent on drinks = $100^{0.}$

If 120^0 = ¢200

Then $100^0 = \frac{100}{120} \times 200$ = ¢167.

Amount spent on drinks = ¢ 167

Books:

Angle representing the amount spent on books

= 140^0.

If 120^0 = ¢200

=>$140^0 = \frac{140}{120} \times 200$

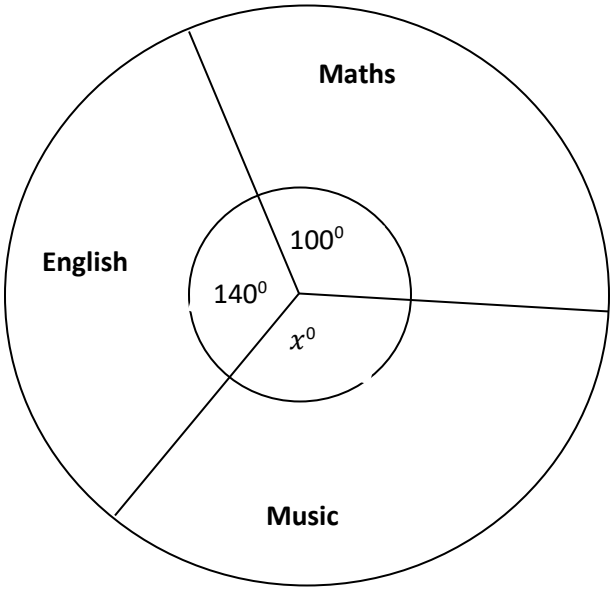
= ¢ 233.

=>Amount spent on books = ¢233.

Total amount spent = amount spent on books + amount spent on drinks + amount spent on food

= ¢233 + ¢167+ ¢200 = ¢600.

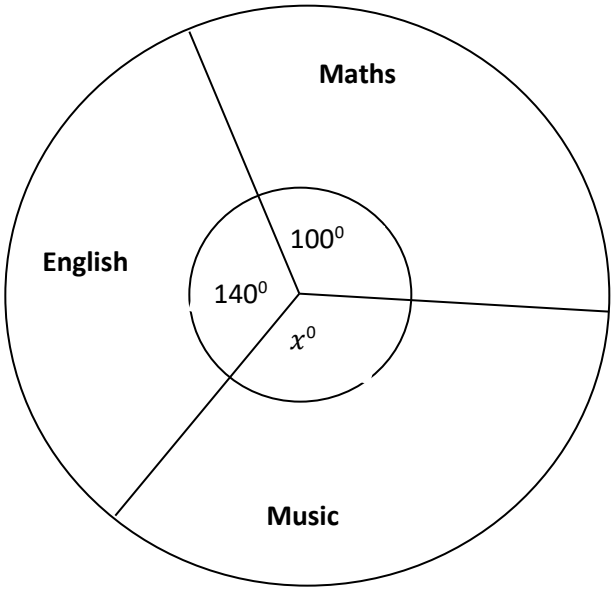
(Q9)



The pie chart shows the marks gained by a student in an examination .If he scored 50 marks in music, determine his marks in

(a) Maths (b) English

Solution



Let x^0 = the angle which represents the marks gained in music.

Since the sum of angles within a circle = 360^0

=> $140^0 + 100^0 + x^0 = 360^0$

=> $240 + x^0 = 360$,

$=>\ x = 360-240=120^0$.

Angle representing the marks gained in music = 120^0

Since the marks gained in music = 50 marks, then 120^0 = 50 marks.

(a)Maths:

Angle representing the marks gained in maths = 100^0.

If 120^0 = 50 marks,

then$100^0 = \frac{100}{120} \times 50 = 41.6$

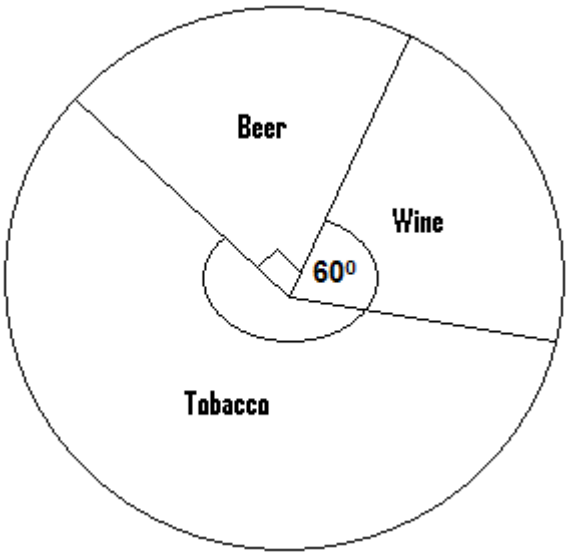
Marks scored in maths = 41.6 marks.

a)English : The angle representing the marks scored in English = 140^0

If 120^0 = 50 marks

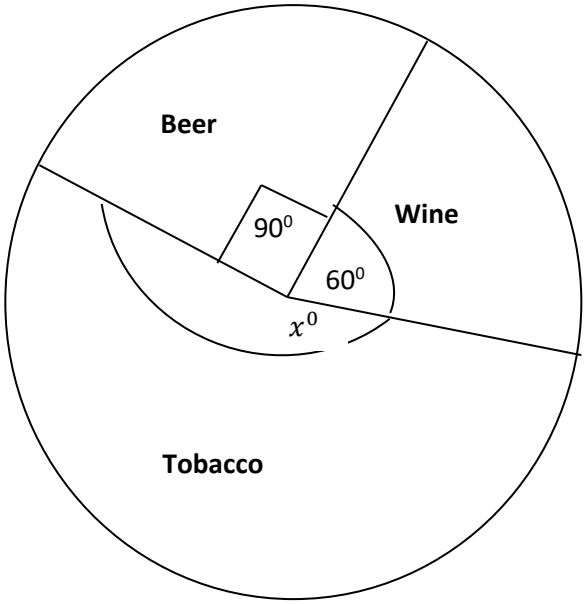
then 1400 = $\frac{140}{120} \times 50$ = 58.3

The marks scored in English = 58.3 marks.



(Q10) The pie chart shows the revenue of custom and excise in a certain year. If the revenue from wine amounted to ₦160, what was the revenue from tobacco?

Soln



Let x = the angle representing the revenue from tobacco.

The angle representing that from beer = 90^0,

since it is a right angle.

Since the total angle within a circle = 360^0,

then $60^0+90^0+x = 360^0$

=> $150^0+ x^0 =360^0$

=> $x = 360^0 - 150^0$

=> $x =210^0$.

The angle representing the revenue from tobacco = 210.

But the angle representing the revenue from wine = 60^0 and this amounted to ₦ 160,

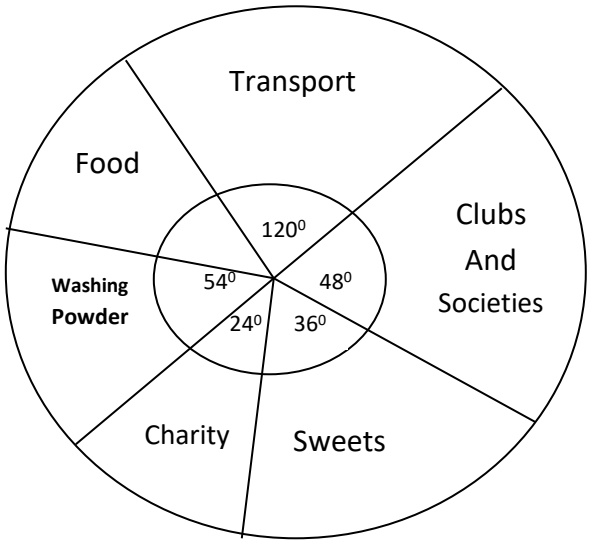
=> 60^0 = ₦ 160.

Now if 60^0 = ₦ 160,

then $210^0 = \frac{210}{60} \times 160 = 560$.

=>Revenue from tobacco = ₦ 560

(Q11)



The pie chart shows how a school girl called Bola, spent her pocket money during a school term. If her donation to charity during the term amounted to 80k, find

a) the total value of Bola's pocket money.

b) What is the size of the angle of sector which represents food items?

c) What is the ratio of the amount spent on washing powder to that spent on sweets?

Solution

a) Bola's donation to charity = 80k and this is represented by an angle of 24^0

$=>24^0 = 80k$.

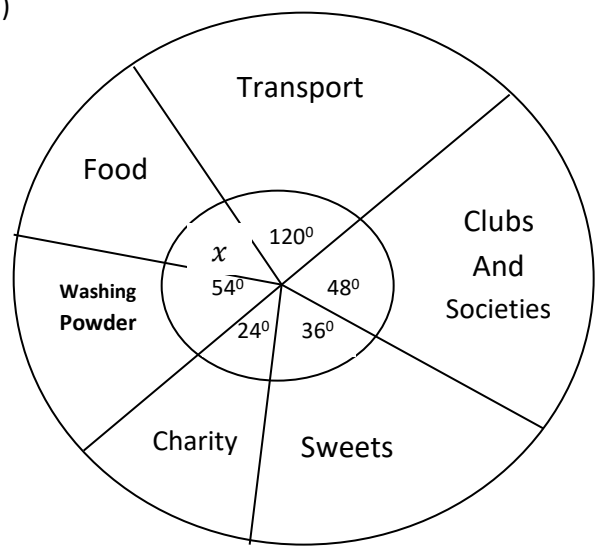
The total value of Bola`s pocket money is represented by the total angle within the circle which is 360^0.

Now if $24^0 = 80k$

then $360^0 = \frac{360}{24} \times 80 = 1200$

The total value of Bola's pocket money =1200k = ₦ 12.

(b)



Let x = the size of the angle representing the amount spent on food.

Since the total angle within a circle = 360^0

=>x +120^0+48^0+36^0+24^0+54^0=360^0

$\therefore \quad x = 360^0 - 282^0 = 78^0$.

(c) Angle representing the amount spent on washing powder = 54^0.

Since her donation to charity = 80k and this was represented by 24^0, =>24^0 = 80k.

Now if 24^0 = 80k

then $54^0 = \frac{54}{24} \times 80$ = 180k, => amount spent on washing powder = ₦1.80.

Also angle representing the amount spent on sweets = 36^0.

Now if 24^0= 80k,

then $36^0 = \frac{36}{24} \times 80$, = 120k = ₦1.20 .

Amount spent on sweets = ₦1.20.

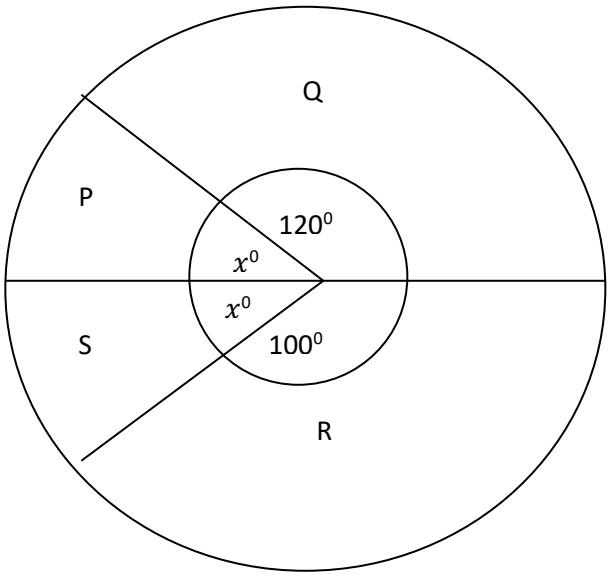
The ratio of the amount spent on washing powder to that spent on sweets

= washing powder : sweets

180 : 120

3 : 2

Q12)



The pie chart shows the time distribution for items from a television station one night.

P = documentaries.

Q = musicals.

R = Serious discussion .

S = News.

If the time spent on discussion was I hour, how much time was spent on news.

Solution

Since the angle which represents the time spent on news = x^0, we must first find x^0. Since the total angle within a circle = 360^0

then $x^0 + x^0 + 120^0 + 100^0 = 360^0$

$\Rightarrow 2x + 220^0 = 360^0$

$\Rightarrow 2x = 360^0 - 220^0 = 140, \Rightarrow 2x = 140,$

$\therefore \quad x = \frac{140}{2} = 70, \Rightarrow x = 70^0$

Since the time spent on discussion was 1 hour or 60 minutes and this is represented by an angle of 100^0,

$\Rightarrow 100^0 =$ 60 minutes.

The angle representing news = $x = 70^0$.

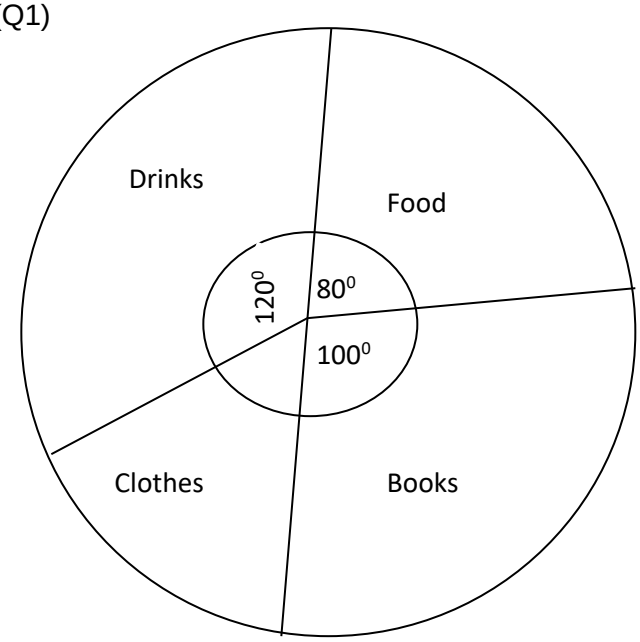
Now if 100^0 = 60 minutes,

then $70^0 = \frac{70 \times 60}{100} = 42.$

Time spent on news = 42 minutes.

Questions

(Q1)

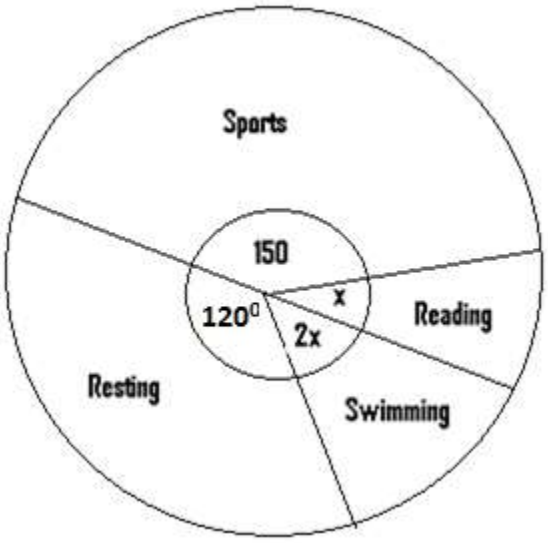


The pie chart shows how a worker spent her monthly salary. If the amount spent on drinks was ¢ 24,

a) show much did she spend on clothes Ans: ¢12.

b) determine the total amount spent , Ans: ¢ 72.

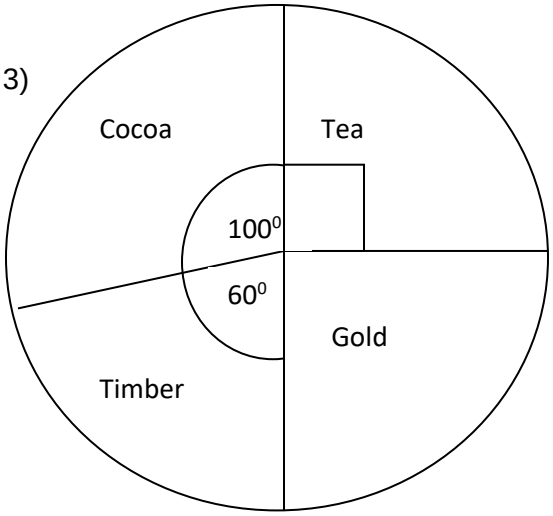
(Q2)



The pie chart shows the way and manner a student spent her leisure time. If she spent 20 minutes swimming, determine the time spent on

(a) Reading Ans: 30 minutes.
(b) Resting Ans: 40 minutes.
(c) How much leisure time did she have? Ans : 120 minutes .

(Q 3)



The pie chart shows the revenue had from four items by a district in Ghana. If the revenue had from gold amounted to ¢2200, determine the amount had from

a) cocoa Ans:¢2000.

b) tea Ans:¢1800.

c) Find the total amount earned by the district from the four items. Ans ¢ 7200.
d) What percentage of the total revenue came from timber Ans : 16.7 %.

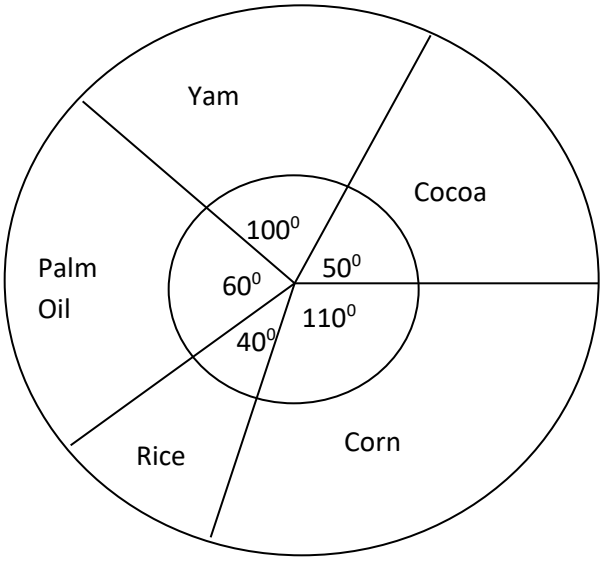
(Q4)

Products	**Weight /kg**
Cocoa	100
Yam	200
Palm oil	120

Rice	80
Corn	220

The table shows the weight of farm crops produced by a farmer, during a farming season.

a) Represent this on a pie chart.



b) Determine the percentage of the total weight, which can be attributed to rice Ans : 11%.

c) Determine also, the ratio of the weight of palm oil produced, to that of rice produced.

Ans: Palm oil: Rice: 3: 2.

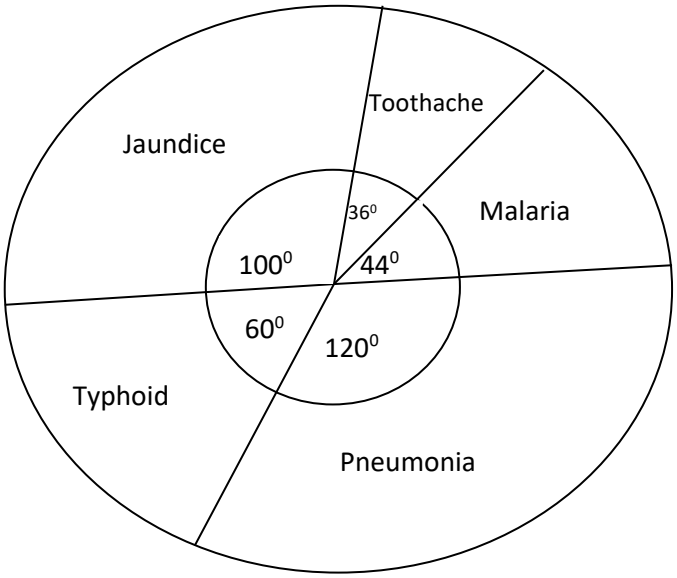
(Q 5) Last month, 90 patients were treated by a doctor, for various diseases and the breakdown is shown in the given table:

Disease	Number of patients
Malaria	11
Tooth ache	9
Jaundice	25
Typhoid	

Pneumonia	15 x

(a) Represents this on a pie chart.

Ans



(b) Find the ratio of the number of typhoid patients to that of the pneumonia patients.

Ans:

Typhoid : Pneumonia

1 : 2

(Q6)

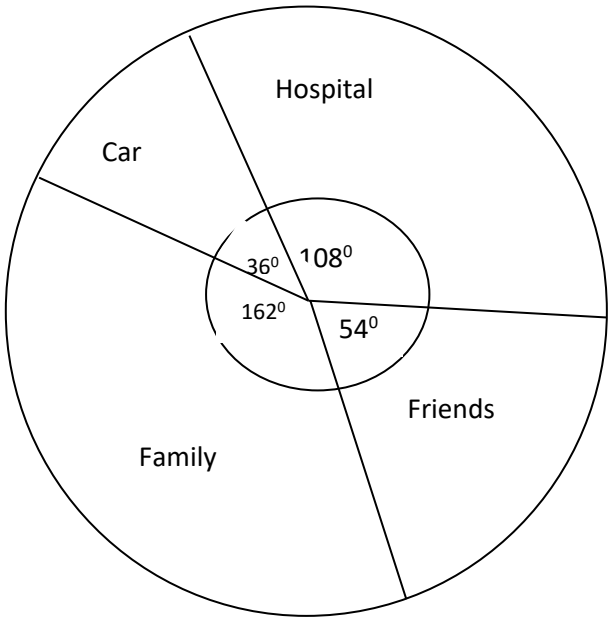
Hospital	30%
Car	y%
Family	45%

Friends	15%

The given table shows the percentage distribution of the amount spent by a doctor, called Tony Addei on his hospital, car, family, and friends.

Represent this on a pie chart.

Ans:



(b) If the doctor spent ¢ 900 on his family, how much did he spend on his friends.Ans: ¢ 300

(c) Determine the total amount spent by the doctor. Ans: ¢2,000