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Province of the
EASTERN CAPE
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**NATIONAL
SENIOR CERTIFICATE**

GRADE 12

SEPTEMBER 2012

MATHEMATICAL LITERACY P2

MARKS: 150

TIME: 3 hours



This question paper consists of 12 pages, including an addendum.

INSTRUCTIONS AND INFORMATION

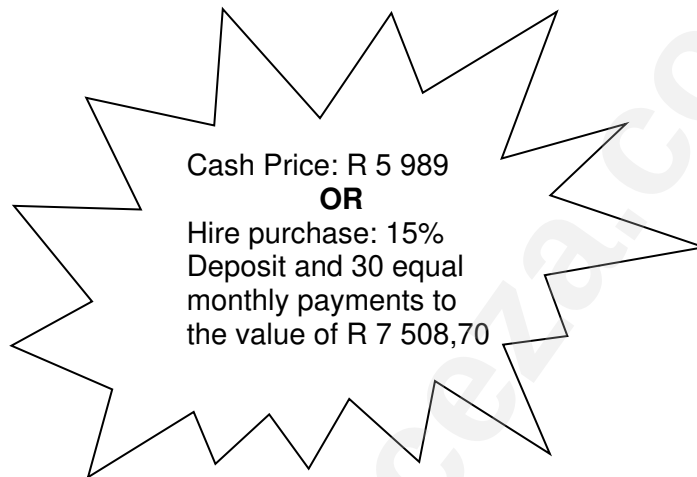
Read the following instructions carefully before answering the questions.

1. This question paper consists of FOUR questions. Answer ALL the questions..
2. QUESTIONS 4.1.6 and 4.3.1 must be answered on the attached ANNEXURE A. Write your name in the spaces provided and hand in the annexure with the ANSWER BOOK.
3. Number the questions correctly according to the numbering system used in this question paper.
4. An approved calculator (non-programmable and non-graphical) may be used, unless stated otherwise.
5. ALL calculations must be shown clearly.
6. ALL the final answers must be rounded off to TWO decimal places, unless stated otherwise.
7. Start EACH question on a NEW page.
8. Write neatly and legibly.

QUESTION 1 (LO1: AS12.1.1, 12.1.2; LO3: AS12.3.1,12.3.2,12.3.3)

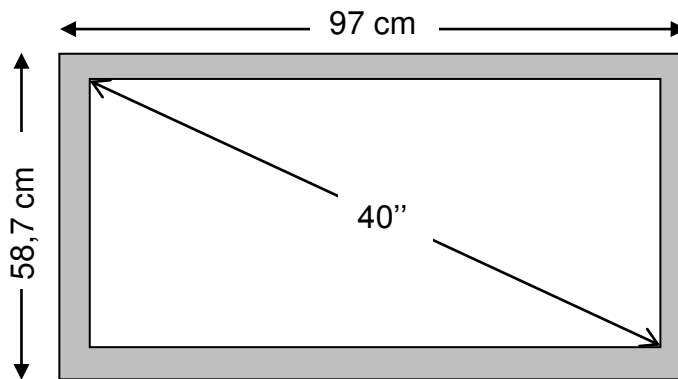
- 1.1 Bingi just started a new job and the one thing that he really wants to buy himself is a flat screen (plasma) television for his room. Seeing that he does not have the cash to pay for the television, he will consider two options.

He saw the following advertisement:

Option 1

- 1.1.1 Calculate how much Bingi will pay for the deposit. (2)
- 1.1.2 How much will Bingi have to pay every month? (2)
- 1.1.3 How much will Bingi pay in total for the television if he buys it on hire purchase? (2)
- 1.1.4 Refer to Option 1 and use the formula $1+ni = \frac{A}{P}$ to calculate what interest rate was charged on the purchase, where;
 A = Final Amount,
 P = Original Amount
 n = Number of years and
 i = Interest Rate (7)
- 1.1.5 If Bingi decides to opt for a loan from a bank (**Option 2**) for the cash value of the television, calculate how much he will have to repay in total on the loan if he has to repay the loan over a 30 month period at an interest rate of 11,25% per annum compounded half yearly. Use the formula $A = P(1+i)^n$ where;
 A = Final Amount,
 P = Original Amount
 n = Number of years and
 i = Interest Rate (5)
- 1.1.6 Which option would you advise Bingi to consider? Give a reason for your answer. (2)

- 1.2 The following is a drawing of the television (without the stand) that Bingi wants to buy. (Drawing not to scale).

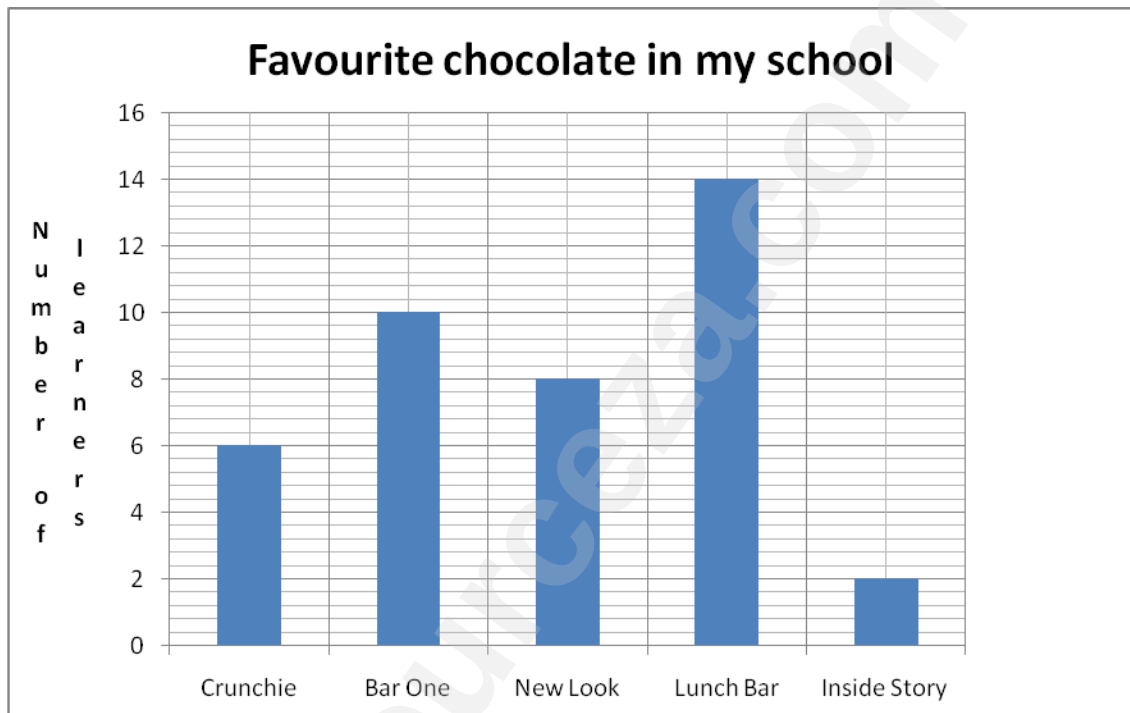


- 1.2.1 The screen of this television is 40" (inches) and is measured diagonally as shown in the diagram. Calculate the actual length of the screen in centimetres if $1'' = 2,5 \text{ cm}$. (2)
- 1.2.2 The screen of the television is surrounded by an outside frame that has a length of 97 cm and a width of 58,7 cm as shown in the diagram. Calculate the area of the television in m^2 . Use the formula; $A = L \times B$. (4)
- 1.2.3 On his wall Bingi has a space of $0,8 \text{ m}^2$ where he wants to mount the television. According to the installation instructions there must be a 10 cm distance on all sides to ensure proper ventilation. Will the space be big enough for the mounting of the television? Show all your answer calculations. (5)
- 1.3 Bingi's two favourite television series are Isidingo and "Sewende Laan", but they are screened during the same time frame (18h30 – 19h00 from Monday to Friday). Isidingo is interrupted by five advertisements of 45 seconds each, while "Sewende Laan" is interrupted by four advertisements of a $\frac{1}{2}$ minute each. Help Bingi to decide which of these series will give him maximum viewing time on one day. Show all calculations. (6)
- [37]

QUESTION 2 (LO2: AS12.2.1, 12.2.3; LO3: AS12.3.1,12.3.2; LO4: AS12.4.1,12.4.4)

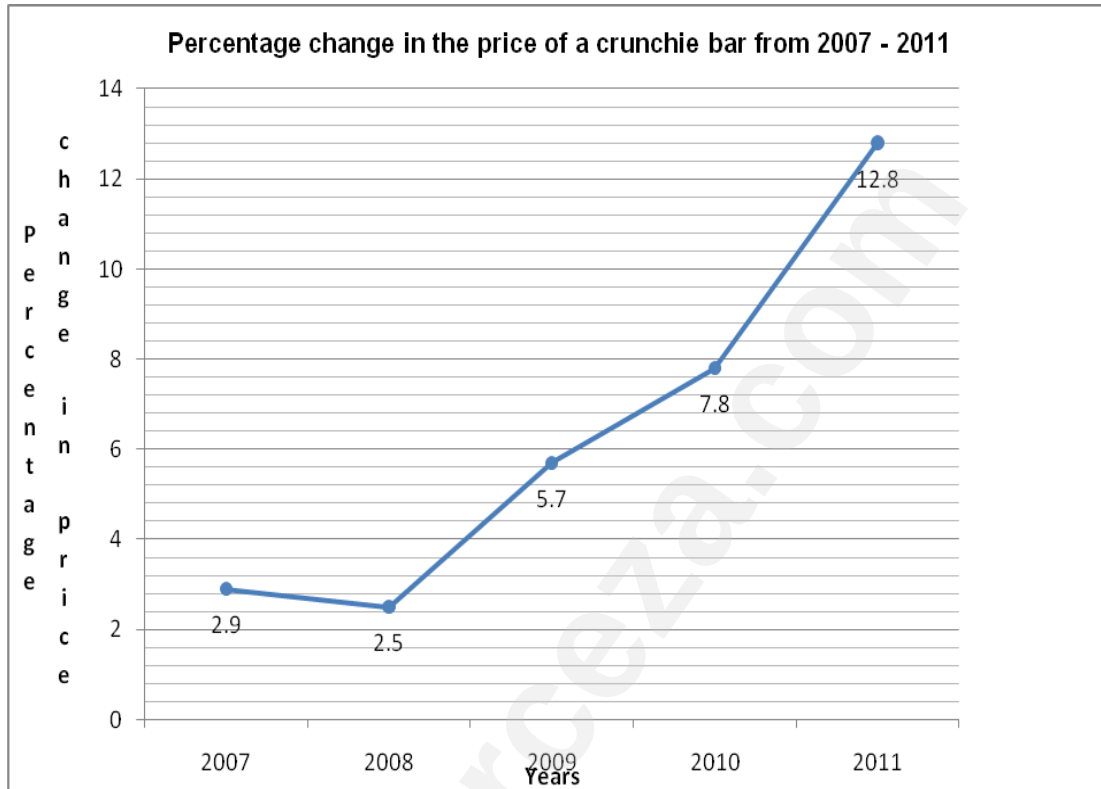
- 2.1 Jamo, a Grade 9 learner, conducted a survey to give to the tuck shop at the school as an indication of the favourite chocolates they have to stock. He conducted the survey in his class.

Below is a bar graph to show Jamo's findings.



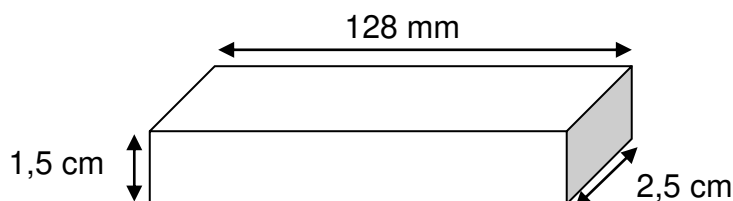
- 2.1.1 How many learners did Jamo interview? (2)
- 2.1.2 If there are 1 030 learners at Jamo's school, calculate what percentage of the learners he interviewed. Give your final answer to 1 decimal place. (3)
- 2.1.3 Do you think that this information is representative of the learners at Jamo's school? Give a reason for your answer. (2)
- 2.1.4 Do you think the heading of the bar graph is correct? If not, correct the heading. (2)
- 2.1.5 The lady in charge of the tuck shop is not happy with Jamo's findings and asks him to conduct a survey that is more widely spread. Explain what she means by 'more widely spread'. (2)
- 2.1.6 To keep the favourite chocolates of the learners in stock, she would like to see 40% of the school's learners interviewed. How many learners must Jamo interview? (2)

- 2.2 The following graph shows the percentage change in the price of a crunchie bar from 2007 – 2011. Study the graph and answer the questions.



- 2.2.1 In which year did the price of the crunchie bar decrease? Explain how it is illustrated on the graph. (2)
- 2.2.2 Between which years did the price of the crunchie bar increase the most? Explain how it is illustrated on the graph. (2)
- 2.2.3 The price of the crunchie bar in 2009 cost R 3,70. Calculate the price of the crunchie bar in 2008. (3)
- 2.2.4 Show how the percentage change in 2011 was calculated if the price in 2010 was R 3,99 and R 4,50 in 2011. (3)

- 2.3 The dimensions of the crunchie bar are illustrated in the diagram below.
(Diagram not drawn to scale)



- 2.3.1 Calculate the volume of the crunchie bar. Give your answer in cm^3 .
Use the formula; Volume = l x b x h. (3)
- 2.3.2 The crunchie bar needs to be covered with chocolate. Calculate the surface area of the crunchie bar in cm^2 .
Use the formula;
Surface Area = 2 x Area of base + perimeter of base x height (5)
- 2.3.3 To keep the crunchie bar fresh, a special wrapping is used. The wrapping that is used to cover the crunchie bar is 12,5% more than the surface area of the crunchie bar. How much wrapping is needed for the crunchie bar? (4)
- [35]

QUESTION 3 (LO1: 12.1.1,12.1.2,12.1.3; LO2: 12.2.1,12.2.3)

- 3.1 Shumeez got a promotion post that pays her much more than she used to earn. Seeing that she is still young, she decided to invest her earnings in buying a house. She applied for a home loan. Advice from family and friends is that a house is a lifetime investment, although it might take you years to pay off the home loan. To buy a house involves many hidden costs.

For this purpose, only certain costs will be dealt with.

She went house hunting and was interested in a house that satisfies her needs. The value of the house is R 1 200 000.

- 3.1.1 To transfer the property to her name, Shumeez has to pay transfer duties on the value of the property. Use the table below and answer the questions that follow.

Property Value	Transfer Duty
Up to R 600 000	R 0
R 600 001 – R 1 000 000	3%
R 1 000 001 – R 1 500 000	R 12 000 + 5% of the amount above R 1 000 000
R 1 500 000 and more	R 37 000 + 8% of the amount above R 1 500 000

- (a) What must the maximum value of a home loan be if no transfer duty is charged? (1)
- (b) Calculate the amount that Shumeez will pay for transfer duty. (5)
- 3.1.2 The bank uses a factor table (see the table below) to calculate the monthly repayments on a home loan.

Table 2 Monthly payment per R1 000 of a home loan, if interest is compounded monthly

Interest rate	7%	8%	9%	10%	11%	12%	13%	14%	15%
20 years	7,75	8,36	9,00	9,65	10,32	11,01	11,72	12,44	13,17
25 years	7,07	7,72	8,39	9,09	9,80	10,53	11,28	12,04	12,81
30 years	6,65	7,34	8,05	8,78	9,52	10,29	11,06	11,85	12,64

- (a) At the time of the sale, the interest rate was 9%. Shumeez opts to repay the home loan over a period of 20 years. How much will she pay every month?

Use the formula:

Monthly repayments = Bond Amount in 1 000 x Factor

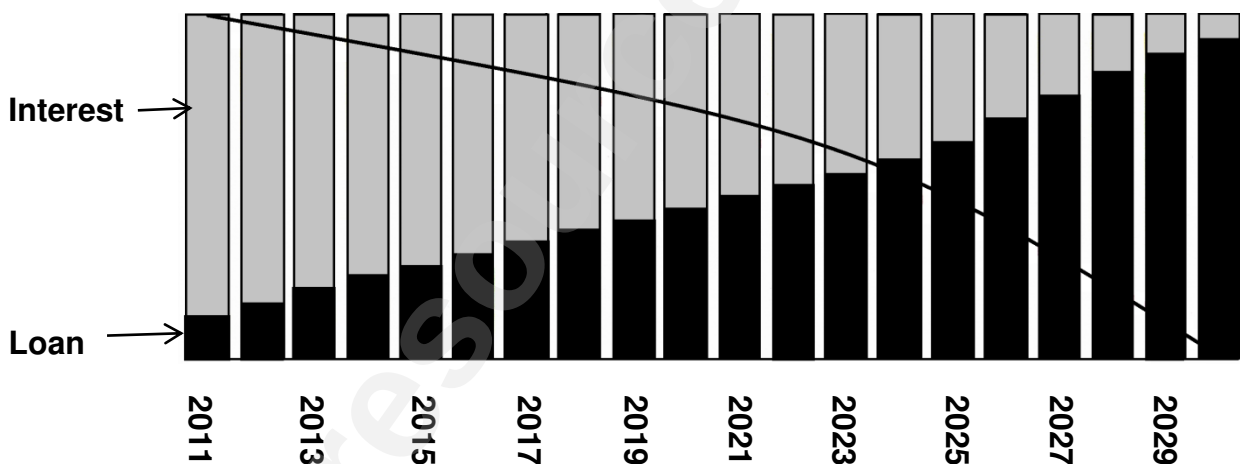
OR

Monthly repayments = $\frac{\text{Bond Amount}}{1000} \times \text{Factor}$

(4)

- (b) If the monthly repayments are not allowed to exceed 30% of her gross monthly salary, will she qualify for the home loan if her gross annual salary is R 450 000? Show your calculations. (5)
- (c) Explain what can be noticed from the monthly repayments if Shumeez has opted to repay the loan over a period of 25 years at the same interest rate. Show all your calculations to support your explanation. (5)
- (d) What is the total amount that Shumeez will pay if it takes her exactly 20 years to pay off the home loan?
(**Exclude all other payments**)
Use the formula:
Final Amount = Monthly repayment x number of payments. (3)
- (e) Calculate the interest that Shumeez will pay on the home loan. (2)

3.2 The graph below shows Shumeez's monthly repayments over a period of 20 years. Study the graph and answer the questions that follow.



- 3.2.1 On what will Shumeez pay off the greatest part of her monthly repayments in the first 10 years? Why do you think this is the case? (3)
- 3.2.2 On what will Shumeez pay off the greatest part of her monthly repayment in the last 10 years? Why do you think this is the case? (3)
- 3.2.3 During which year will Shumeez pay approximately the same amount of her monthly repayment on both the interest and loan? (2)
- 3.2.4 Why do you think it takes about 20 – 30 years to pay off a home loan, while it only takes about 5 – 6 years to pay off a car? (2)

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QUESTION 4 (LO1: AS12.2.1,12.2.2,12.2.3; LO3: AS12.3.1, LO4: AS12.4.4, 12.4.5)

Ms Mbete is planning a party for her three year old daughter. She approached an events planning company to do the planning for her. She informed them that she wants to invite 45 children.

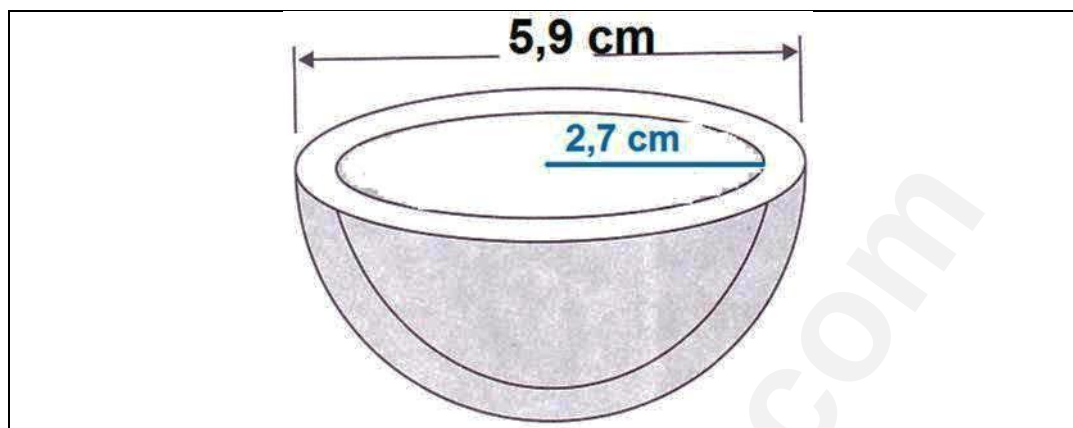
- 4.1 The events planning company came up with the following table. They can only provide for a minimum of 10 and a maximum of 50 children.

Table 3

Price per child	300	A	100	75	60
Number of children	10	20	30	B	50

- 4.1.1 What is the amount payable by Ms Mbete if any of the above conditions are used? (2)
- 4.1.2 Use the table above as well as your answer in QUESTION 4.1.1 to write down a formula. Use amount payable as (A), price per child as (p) and number of kids as (n). (3)
- 4.1.3 Use the formula in QUESTION 4.1.2 to calculate the missing value A and B respectively. (4)
- 4.1.4 Use the formula to calculate the price per child that Ms Mbete wants to invite. (2)
- 4.1.5 Explain the relationship between the *price per child* and the *number of children*. (2)
- 4.1.6 Use the information in the table to draw a graph (on Annexure A) that shows the relationship between the price per child and the number of children. (5)

- 4.2 The toy that the children received was in the shape of a ball. Inside the ball was a mystery toy. The shape of the ball is illustrated below and only shows the one half of the ball. (Diagram not drawn to scale)



- 4.2.1 If the length of the toy must be 2 mm shorter than the diameter of the inner ball, what is the maximum length of the toy in centimetre? (4)
- 4.2.2 Calculate the volume of the inner ball.
Use the formula: $\text{Volume} = \left(\frac{4}{3}\right)\pi r^3$, where $\pi = 3,14$ (3)
- 4.3 Ms Mbete only invited children aged two to five years old. Study the following contingency table and answer the questions that follow.

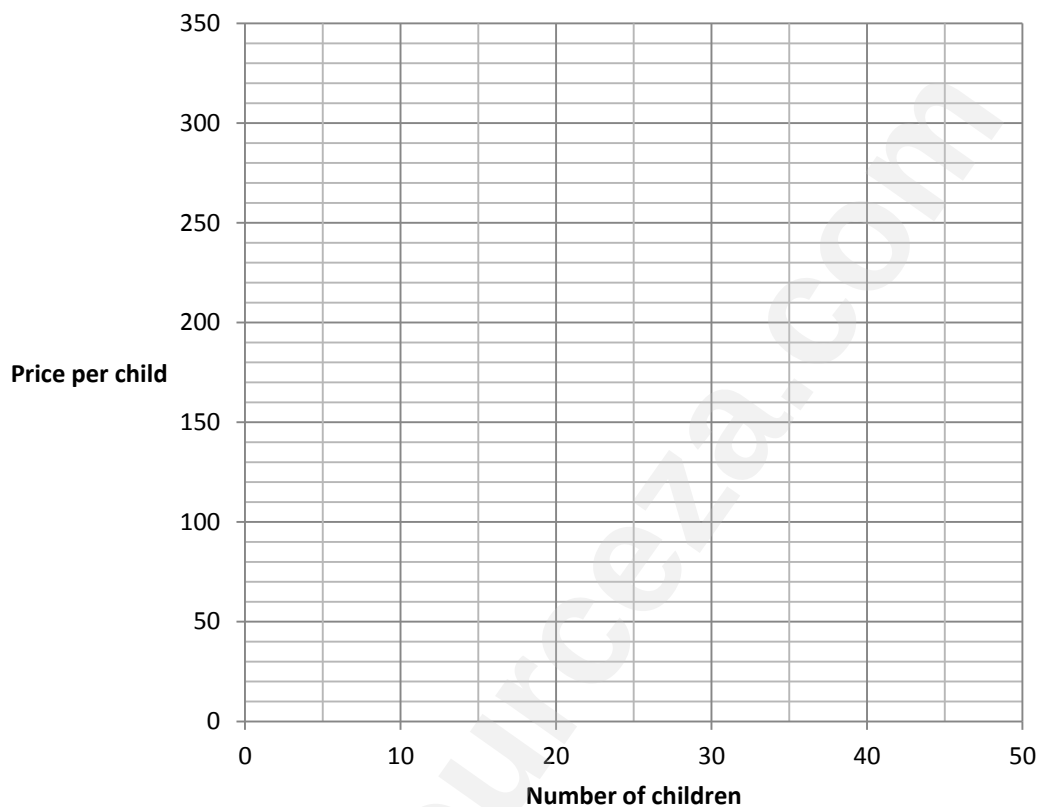
Table 4: Ages of boys and girls invited to the party

	2 years	3 years	4 years	5 years	Total
Boys	5	3			22
Girls		8	5	6	
Total	9		11	14	45

- 4.3.1 Complete the contingency table (see ANNEXURE A). (5)
- 4.3.2 Use the completed contingency table to calculate the average age of the children who were invited. (4)
- 4.3.3 Use your completed contingency table to answer the following questions:
- (a) Calculate the probability that a girl aged 5 years will be invited to the party. (3)
 - (b) Calculate the probability that a boy will be invited to the party. (3)
 - (c) Calculate the probability that a boy or a girl of 2 years will be invited to the party. (3)

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TOTAL: 150

ANNEXURE A**NAME:** _____**QUESTION 4.1.6****QUESTION 4.3.1****Table 4: Ages of boys and girls invited to the party**

	2 years	3 years	4 years	5 years	Total
Boys	5	3			22
Girls		8	5	6	
Total	9		11	14	45