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101 Must-Know Challenging Maths Word Problems

Book 5

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Name: _____

Class: _____

Preface

101 Must-Know Challenging Maths Word Problems Book 5 presents word problems that test on important concepts so students can learn to apply general mathematical problem-solving strategies and heuristics confidently.

What's in this book?

This book comprises word problems often encountered by students in their tests and examinations. The questions are categorized into respective topics in accordance with the current **Primary Mathematics Syllabus.**

Solutions

Detailed step-by-step workings are included in the answer key for every question to show how a problem is solved. Diagrams and mathematical models are provided in most solutions to aid students in understanding the problem-solving processes.

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Contents

Question 1

In a game for 24 groups, the average number of children was 16. When one more group of children was formed to join in the game, the average number of children became 18. The number of boys to girls who had just joined in the game was in the ratio 5 : 6. If there were 220 boys at first, how many more boys than girls were there in the end?

Answer: _____

Question 2

$\frac{1}{2}$ of a number is 90 more than $\frac{1}{5}$ of the same number. What is the number?

Answer: _____

Question 3

A florist arranges some orchids in bouquets of 20 and some roses in bouquets of 10. She sells each orchid bouquet for $25 and each rose bouquet for $30. She earns a total of $390. If she sells four times as many orchid bouquets as rose bouquets, how many flowers does she sell altogether?

Answer: _____

Question 4

Ken and Ivan had some sweets. After Ken gave away $\frac{5}{7}$ of his sweets, he had $\frac{2}{3}$ as many sweets as Ivan. Ivan then gave away 120 sweets and he had $\frac{1}{4}$ as many sweets as Ken. How many sweets did each of them have at first?

Answers: Ivan: _____

Ken: _____

Question 5

Hotel A and Hotel B had a total of 6500 guests. After $\frac{3}{4}$ of the guests in Hotel A and $\frac{3}{5}$ of the guests in Hotel B checked out, there were 260 more guests in Hotel B than in Hotel A. How many guests did Hotel A have at first?

Answer: _____

Question 6

There were 900 sweets in 3 boxes, A, B and C. 18 sweets were transferred from A to B and 5 sweets were transferred from B to C. $\frac{1}{3}$ of the sweets in C were then transferred to A. There was then an equal number of sweets in all 3 boxes. How many sweets were there in each box at first?

Answers: Box A: _____

Box B: _____

Box C: _____

Question 7

Some boys and girls took part in a competition. $\frac{2}{5}$ of the competitors were boys. $\frac{1}{3}$ of the boys were disqualified from the competition. If there were 135 competitors at first, how many more girls than boys were left?

Answer: _____

Question 8

Mrs Walker had some lemons. She put $\frac{1}{2}$ of the lemons equally into 5 bags and the other half equally into 6 containers. There were 63 lemons in one bag and 3 containers altogether. How many lemons did Mrs Walker have?

Answer: _____

Question 9

The ratio of the number of biscuits that Andy and Betty had was 2 : 5. After Andy bought 24 more biscuits, the ratio became 16 : 10. If there were 6 biscuits in a pack, how many packs of biscuits would Betty have to buy so that they would have the same number of biscuits in the end?

Answer: _____

Question 10

Megan and Olivia had some money. They made a donation of $100 together. Megan donated $\frac{1}{5}$ of her money. After donating $24, Olivia found that she had $32 more than Megan. What was the sum of money both of them had at first?

Answer: _____

Question 11

Mrs Benjamin baked some butter cookies and chocolate chip cookies in the ratio 7 : 3. After giving away 24 butter cookies, the ratio of butter cookies to chocolate chip cookies was 11 : 6. She then packed the rest of the cookies into bags of 4 without mixing them. How many bags of cookies of each type did she have?

Answers: _____ bags of butter cookies

_____ bags of chocolate chip cookies

Question 12

There were some red, yellow and blue toy cars in a box. $\frac{3}{8}$ of the toy cars were red and 26 were blue. The rest were yellow. If there were 12 fewer yellow toy cars than blue toy cars, how many red toy cars were there?

Answer: _____

Question 13

There were 900 oranges and apples in a box. When $\frac{7}{9}$ of the oranges and $\frac{2}{3}$ of the apples were taken out from the box, there was an equal number of oranges and apples left. How many more oranges than apples were there at first?

Answer: _____

Question 14

There were 48 entries from Primary 1 and Primary 2 in a storytelling competition. The rest were from Primary 3. If 30 entries were not from Primary 1 and 28 entries were not from Primary 2, how many entries were there altogether?

Answer: _____

Question 15

In a kindergarten, 12% of the students are Malays and the rest are Chinese. 50% of the Chinese and 12.5% of the Malays are boys. There are 912 more Chinese than Malay students. How many girls are there in the kindergarten?

Answer: _____

Question 16

The ratio of the number of oranges to papayas in a basket is 3 : 5. After $\frac{1}{4}$ of the oranges and $\frac{1}{2}$ of the papayas are eaten, there are 16 more papayas than oranges in the basket. How many fruit of each type are there in the basket at first?

Answers: _____ oranges

_____ papayas

Question 17

Terence and Cynthia had some balloons in the ratio 5 : 9. When 15 of Terence's balloons burst, the ratio of Terence's to Cynthia's balloons was 10 : 27. How many balloons did each of them have at first?

Answers: Terence: _____

Cynthia: _____

Question 18

Mr Willis had some oranges and pears. 60% of them were oranges. 70% of the pears and 40% of the oranges were sold. 240 fruit were not sold. How many fruit did Mr Willis have at first?

Answer: _____

Question 19

Joel and Anson have some marbles in the ratio 7 : 5. If Joel gives Anson 36 marbles, Anson will have twice as many marbles as Joel. How many marbles do they have altogether?

Answer: _____

Question 20

There were 750 shirts in a box. 20% of them were pink and 18% were green. The remaining shirts were either yellow or black. If there were 85 more black shirts than yellow shirts, what was the total number of black and green shirts in the box?

Answer: _____

Question 21

There are some apples in 3 baskets, A, B and C. The ratio of the number of apples in A to B is 5 : 3. There are 112 apples in C. If the ratio of the total number of apples in A and B to the number of apples in C is 6 : 2, how many more apples are there in A than in B?

Answer: _____

Question 22

There were some red, blue and green rubber bands in a box. $\frac{2}{5}$ of the rubber bands were red. There were 40 green rubber bands and 24 more blue rubber bands than red rubber bands. How many rubber bands were there altogether?

Answer: _____

Question 23

Francis, Philip and Jamie had twenty-cent, fifty-cent and one-dollar coins respectively. Francis had five times as many coins as Jamie. Philip had half the number of coins that Jamie had. If Philip had 27 fewer coins than Francis, how much money did they have altogether?

Answer: _____

Question 24

There were some apple pies and lemon pies in two boxes, A and B. Box A had 40% of the total number of pies. Box B had 12 apple pies. If 75% of the pies in box B were lemon pies, what was the total number of pies in both boxes?

Answer: _____

Question 25

Juliana and Patrick had some marbles. If Juliana gave Patrick 20 marbles, both of them would have an equal number of marbles. If Patrick gave Juliana 20 marbles, Juliana would have 3 times as many marbles as Patrick. Find the number of marbles that each of them had.

Answers: Juliana: _____

Patrick: _____

Question 26

On Sunday, Mrs Campbell baked some cookies and put all of them into a box. She then took out $\frac{2}{5}$ of them. Of these, 15 were given away and the remaining 23 were eaten. On Monday, she baked another tray of cookies. She put $\frac{3}{4}$ of them into the same box. There were now 183 cookies in the box altogether. How many cookies did Mrs Campbell bake on Monday?

Answer: _____

Question 27

A bag of sweets was shared among Bob, Nancy, Lucy and Nicholas. Bob had twice as many sweets as Nancy. The number of sweets that Lucy had was $\frac{1}{2}$ the total number of sweets that Bob and Nancy had. Nicholas had 90 sweets which was three times as many sweets as what Lucy had. How many sweets were there in the bag?

Answer: _____

Question 28

Sandra, Ted and Justina had a total of 377 coins. Sandra gave Justina 15 coins and Ted received 13 coins from Justina. In the end, the ratio of the number of coins that Sandra and Ted had was 4 : 3 respectively and the ratio of the number of coins that Sandra and Justina had was 3 : 2 respectively. How many coins did each of them have at first?

Answers: Sandra: _____

Ted: _____

Justina: _____

Question 29

A farm had some cows and goats. $\frac{1}{5}$ of the cows and $\frac{3}{11}$ of the goats were sold. There was an equal number of cows and goats left. If there were 704 cows and goats left, how many animals were on the farm at first?

Answer: _____

Question 30

$\frac{3}{5}$ of the 60 balloons used at a party were green and the rest were yellow. If 6 green balloons and 3 yellow balloons burst, what fraction of the remaining balloons were green?

Answer: _____

Question 31

Peter was given a crate of cups. He sold all the cups. Each cup was sold at $8.90. For every set of 5 cups purchased by a customer, a cup was given free. $\frac{2}{3}$ of the cups were sold in sets of 5 cups. He collected $1174.80 altogether. How many cups were there in the crate at first?

Answer: _____

Question 32

Samantha, Jerry, Mandy and Tim scored an average of 68.75 points for a game. Tim's score was $\frac{2}{3}$ of Mandy's score and Mandy's score was $\frac{1}{2}$ of Jerry's score. Samantha's score was $\frac{1}{4}$ of Jerry's score. What was the average score of Mandy and Samantha?

Answer: _____

Question 33

Jane, Alice and Peter had a sum of money. After Jane spent $\frac{1}{4}$ of her money, Alice spent \$80 of hers and Peter spent $\frac{1}{2}$ of his money, they had an equal amount of money left. If they had a total of \$1008 in the end, how much did each of them have at first?

Answers: Jane: _____

Alice: _____

Peter: _____

Question 34

A tank measures 20 cm by 15 cm by 30 cm. Pump A and Pump B release amounts of water in the ratio 3 : 2 respectively. The two pumps can fill a tank with half a litre of water in 2 minutes. How long will it take Pump B alone to fill the tank completely with water?

Answer: _____

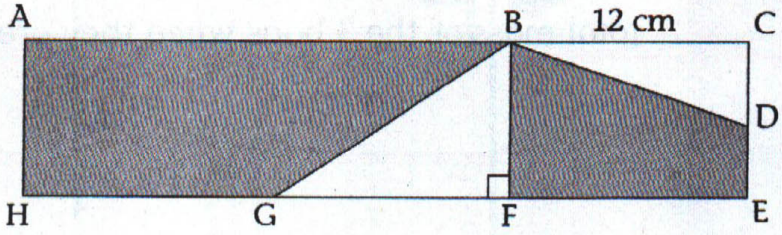
Question 35

The cost of a book, toy and hat is in the ratio 5 : 2 : 9. The average cost of the three items is $32. When a belt is added, the average cost becomes $30. What is the difference between the cost of the book and the belt?

Answer: _____

Question 36

ACEH is a rectangle. Its length is five times its breadth. The length is 30 cm. D is the midpoint of CE and G is the midpoint of HF. Find the total area of the shaded portions.



Answer: _____

Question 37

Mrs Baker bought some flour. She used $\frac{1}{4}$ of it to bake 6 cherry pies and packed the rest equally into 9 bags. There were 250 g more flour in 2 similar bags than what was used for a cherry pie. If all the flour was packed into 25 bags instead, how much flour would there be in each bag?

Answer: _____

Question 38

The average mass of 3 bags, A, B and C when they are full is 38 kg. When all the items from bag A are taken out, the average mass of the 3 bags become 30 kg. The mass of the items from bags B and C is in the ratio 7:3. If the mass of the items in bag B is 20 kg heavier than the items in bag C, what is the total mass of the 3 bags when they are empty?

Answer: _____

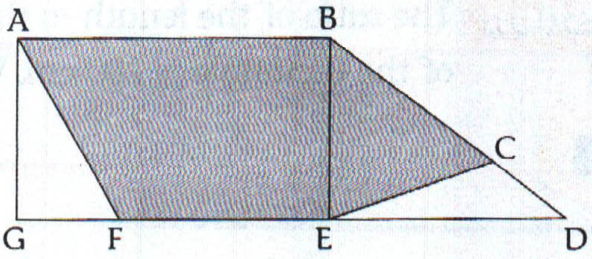
Question 39

A tank was filled with 2520 cm^3 of sand. $\frac{1}{5}$ of the sand was poured into a rectangular container which already contained 7112 cm^3 of sand. If the container had a base of 16 cm by 28 cm, what was the height of the sand in the container in the end?

Answer: _____

Question 40

The ratio of the area of the shaded to the unshaded portions in rectangle ABEG is 5 : 3. The ratio of the area of triangle BCE to triangle AGF is 3 : 2. The area of rectangle ABEG is 152 cm^2. The area of triangle CDE is $\frac{1}{4}$ the area of rectangle ABEG. Find the difference between the area of the shaded portions and the unshaded portions of the figure.



Answer: _____

Question 41

Aaron bought 2 similar books and 3 similar rulers for $40.30. Sharon bought 3 such books and 5 such rulers for $61. What was the cost of a book and a ruler?

Answer: _____

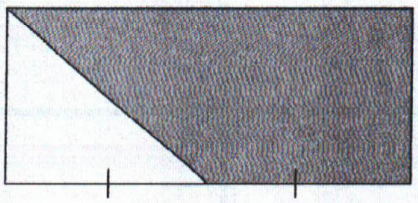
Question 42

A tank measuring 12 cm by 16 cm by 24 cm is $\frac{2}{3}$ filled with water. $\frac{1}{2}$ the amount of water fills $\frac{2}{5}$ of a basin. What is the capacity of the basin?

Answer: _____

Question 43

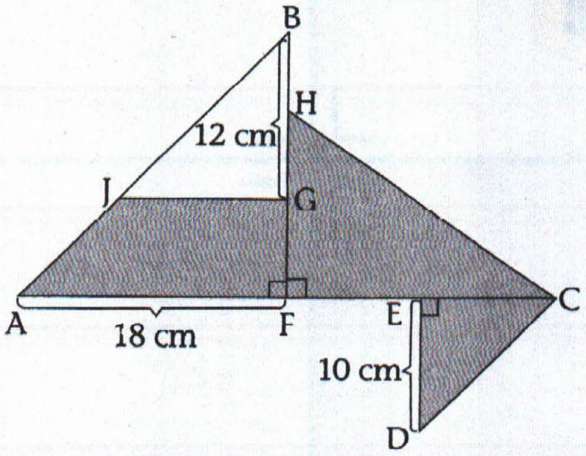
The ratio of the length to the breadth of the rectangle is 7 : 3. The perimeter of the rectangle is 280 cm. What is the area of the shaded portion?



Answer: _____

Question 44

In the figure below, GF is $\frac{2}{5}$ of BG and JG is $\frac{2}{5}$ of AF. GF is $\frac{3}{5}$ of HF and EC is $\frac{1}{2}$ of FC. FC = AF. AFC is a straight line. Find the total area of the shaded portions.



Answer: _____

Question 45

A tank measures 25 cm by 18 cm by 30 cm. Water is poured into the tank until it is $\frac{3}{5}$ filled. Some of the water is then poured into 2 similar containers, filling them to the brim. 950 cm^3 of water is then added to the tank until it is half-full. What is the capacity of each container?

Answer: _____

Question 46

Josephine had $80 more than Alex. If Alex gave Josephine $16, Josephine would have three times as much money as Alex. How much did each of them have at first?

Answers: Josephine: _____

Alex: _____

Question 47

A bag costs $24.50 more than a wallet. The total cost of 2 bags and a wallet is $85. What is the total cost of 3 wallets and 3 bags?

Answer: _____

Question 48

Clarence withdrew 25% of his savings from the bank on Monday. He spent $720 on a television set, $163 on a radio and the remaining $37 on a clock. He received his salary the following day and deposited $\frac{2}{5}$ of it into the bank. As a result, the total amount in his bank account increased to $4680. Find Clarence's salary.

Answer: _____

Question 49

James is 8 years old. Last year, his father was 4 times as old as he was. In how many years' time will their combined age be 51 ?

Answer: _____

Question 50

Anna made full payment and bought a refrigerator at 20% discount during a sale. Joan paid a down payment of $399 and the rest in 12 monthly instalments of $250. This was 10% more than making full payment of the refrigerator during the sale. What was the price of the refrigerator before the sale?

Answer: _____

Question 51

Jessica spent $\frac{2}{3}$ of her money on a book and a toy. Don spent $\frac{1}{5}$ of his money on the same items. The book cost $18 and the toy cost $6 less. How much more money did Don have than Jessica at first?

Answer: _____

Question 52

Sean deposited $1500 in a bank, earning an interest of 3% per year. If he took out $\frac{1}{3}$ of the money after 2 years and that the interest was fixed at 3% each year, how much would he have left in the bank?

Answer: _____

Question 53

Jason had a sum of money. He spent an equal amount of money each day. After 6 days, he had $\frac{3}{5}$ of his money left. 3 days later, he had $360 left. What was the sum of money he had at first?

Answer: _____

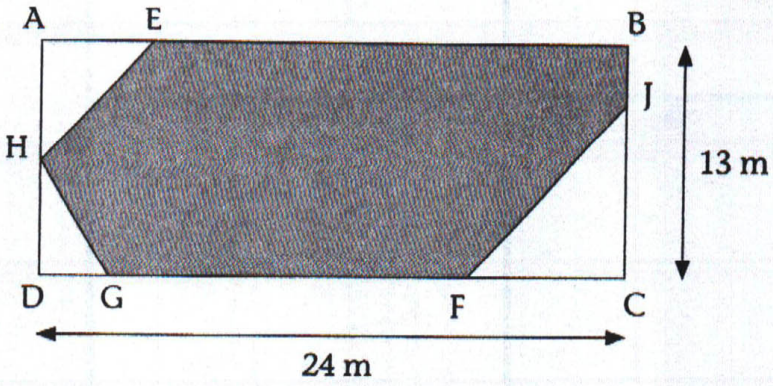
Question 54

A tank measuring 15 cm by 24 cm by 28 cm was $\frac{3}{4}$ filled with water. When 45% of the water from the tank was poured into an empty container, the container became $\frac{2}{5}$ full. What was the base area of the container if the height of the container was 30 cm?

Answer: _____

Question 55

ABCD represents a room in Mr Lee's house. He wants to paint the shaded area at a cost of $10 per square metre. The areas AEH, JCF and GDH are in the ratio 6 : 7 : 5 respectively. If it costs $125 to paint GDH, how much will it cost to paint the shaded area?



Answer: _____

Question 56

The total number of pears and oranges in a basket was 980. After $\frac{1}{3}$ of the pears and 230 oranges were sold, the ratio of pears to oranges left became 2 : 3. What was the ratio of pears to oranges at first?

Answer: _____

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Question 57

The ratio of Harry's cards to William's cards was 3 : 4. After Harry bought 12 cards and William lost 24 cards, the ratio became 3 : 2. Find the total number of cards Harry and William had at first.

Answer: _____

Question 58

A fruit seller had 2520 apples and oranges. There were $\frac{2}{3}$ as many apples as oranges. He threw some rotten apples away and the ratio of apples to oranges became 1 : 4. How many rotten apples did he throw away?

Answer: _____

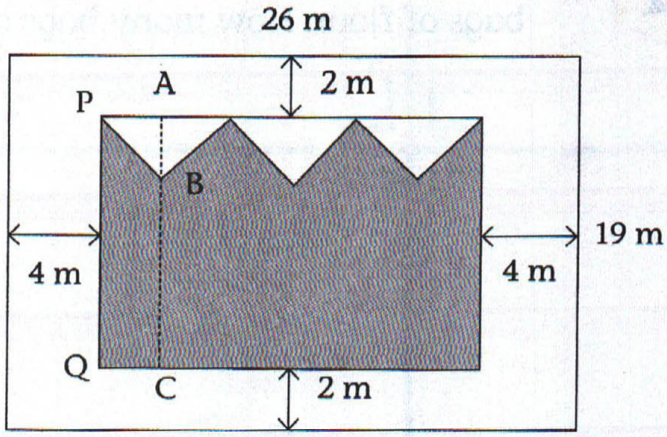
Question 59

Jake, Mandy and Ann had 360 sweets in the ratio 4 : 3 : 5 respectively. Jake gave $\frac{1}{3}$ of his sweets to Mandy and Ann gave 40% of her sweets to Jake. What was the ratio of Jake's sweets to Ann's sweets in the end?

Answer: _____

Question 60

The figure is made up of 2 rectangles and 3 similar triangles. The length of PQ to BC is in the ratio 5 : 3. Express, as a ratio, the area of the shaded portion to the area of the small rectangle.



Answer: _____

Question 61

There were 350 marbles in a box. 40% of them were red. There were 10% more red marbles than green marbles. The rest were white and orange marbles. If there were twice as many white marbles as orange marbles, how many more red marbles than white marbles were there?

Answer: _____

Question 62

Wilson bought some flour. He gave 20% of the flour to Mike and 25% to Mary. He gave them 72 kg of flour in total. He then packed the rest of the flour into 2-kg and 3-kg bags. There were twice as many 3-kg bags as 2-kg bags of flour. How many bags of each type were there?

Answer: _____

Question 63

During a sale, the price of a television set fell by 20% of its original price. After the sale, the price increased by 5% of its original price. Jane bought the television set during the sale. She paid $300 as down payment and the rest in 16 (interest-free) monthly instalments of $120 each. How much was the television set after the sale?

Answer: _____

Question 64

There were English, Chinese and Malay books in a box. 20% of the books were English books. The number of Chinese books to Malay books was in the ratio 4 : 3. After 10% of the Chinese books were sold, there were 72 Chinese books left in the box. How many books of each type were in the box at first?

Answers: English: _____

Chinese: _____

Malay: _____

Question 65

40% of the students in a class joined the Art Club. 20% of the remaining students joined the Dance Society. The rest joined the choir. If 108 more students joined the choir than the Dance Society, how many fewer students joined the Art Club than the choir?

Answer: _____

Question 66

Peter spent 20% of his weekly salary on food. Of the remainder, he saved some and gave his mother some money, in the ratio 5 : 2. If he saved $210 more than what he had given his mother, how much did he spend on food each week?

Answer: _____

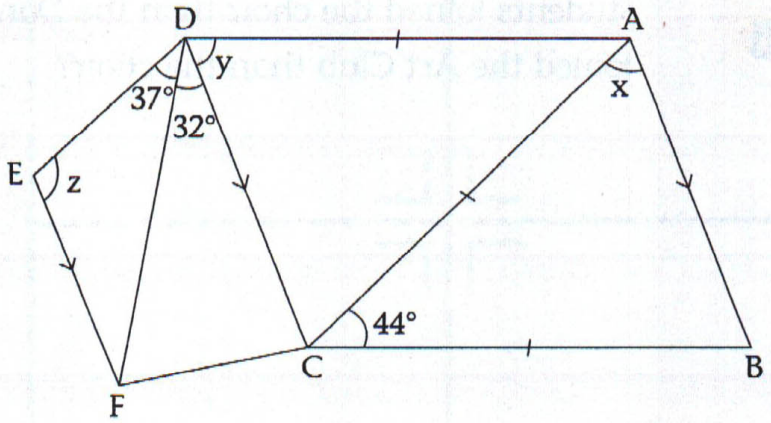
Question 67

60% of the total number of people at the swimming complex were women. When 72 more women entered the swimming complex, the number of women increased by $\frac{1}{3}$ the total number of women who were there at first. How many men were there at first?

Answer: _____

Question 68

In the figure below, not drawn to scale, ABCD is a parallelogram and CDEF is a trapezium. Find $\angle x$, $\angle y$ and $\angle z$.



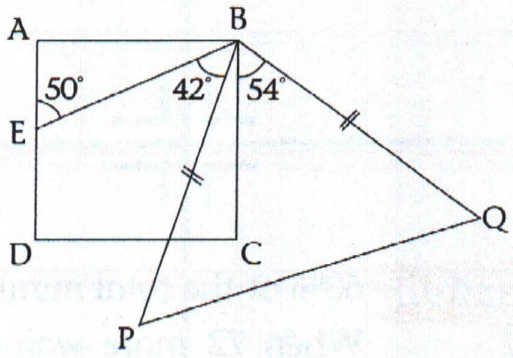
Answers: $\angle x =$ _____

$\angle y =$ _____

$\angle z =$ _____

Question 69

ABCD is a square and BPQ is an isosceles triangle. Find $\angle BPQ$.



Answer: _____

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Question 70

Mrs Cox made some muffins. She kept 15% of them for herself. 20% of the muffins were given to charity and 10% to her neighbour. $\frac{3}{5}$ of the remaining muffins were sold. The rest were given to her children. Her children received 66 muffins.

(a) How many muffins did Mrs Cox make?

(b) If each muffin cost $1.40, how much money did Mrs Cox collect?

Answers: (a) _____

(b) _____

Question 71

During a sale, a computer was sold at a 40% discount and a television set was sold at a 20% discount. Jenny bought 2 computers and a television set during the sale. She paid a total of $5970. If she paid $4980 for the computers,

(a) what was the original price of the television set?

(b) What was the original price of a computer?

Answers: (a) _____

(b) _____

Question 72

There were 1518 boys and girls in the hall. When $\frac{2}{3}$ of the boys and $\frac{1}{5}$ of the girls left the hall, there were twice as many girls as boys who remained in the hall.

(a) How many girls were there at first?

(b) How many boys were there at first?

Answers: (a) _____

(b) _____

Question 73

There were 741 men and women in a room. When $\frac{5}{7}$ of the men and $\frac{1}{3}$ of the women left the room, there were twice as many women as men who remained in the room.

(a) How many women were there in the room at first?

(b) How many men were there in the room at first?

Answers: (a) _____

(b) _____

Question 74

Joel, Zack, Alvin, Linda and Adeline scored an average mark of 87 in a mathematics test. Joel, Zack and Alvin had an average mark of 85. Linda, Adeline and Zack had an average mark of 88. Linda and Adeline had the same mark.

(a) How many marks did Zack score?

(b) Find the total mark scored by Joel and Alvin.

Answers: (a) _____

(b) _____

Question 75

Electricity	
Number of Units Used	**Amount**
1st 1000 or less	$2.20
Next 1000 or less	$2.50
Next 1000 or less	$2.80
Next 1000 or less	$3.00

The table shows the amount paid when electricity is used. Tom's household meter showed 1045 units at the beginning of January. By the end of January, it showed 4090 units.

(a) How much did he have to pay at the end of January?

(b) Tom paid $7.50 at the end of February. What was the maximum number of units that could be shown on the household meter at the end of February?

Answers: (a) _____

(b) _____

Question 76

$\frac{1}{2}$ of the sweets in box A were equivalent to $\frac{3}{8}$ of the sweets in box B. 240 sweets from box B were taken out and box A then had three times as many sweets as box B.

(a) What was the total number of sweets in the two boxes at first?

(b) How many sweets would have to be taken out from box A so that there would be $\frac{1}{4}$ as many sweets in box A as in box B?

Answers: (a) _____

(b) _____

Question 77

There were 156 men and women at a party. $\frac{1}{6}$ of the men and 24 women left the party. There was then an equal number of men and women at the party.

(a) How many men were at the party at first?

(b) How many women were at the party at first?

Answers: (a) _____

(b) _____

Question 78

Machine A can produce 7500 biscuits a day. This is 240 fewer biscuits than what machine B can produce in a day. 20 biscuits are placed in a pack and thereafter 1000 packs of biscuits will be placed in a box.

(a) If both machines A and B are used, how many packs of biscuits will there be after a week?

(b) How many complete boxes of biscuits will there be after a week?

Answers: (a) _____

(b) _____

Question 79

The table below shows the price of greeting cards sold at a shop.

Number of sets	Selling Price
1 – 5	$15.50 per set
6 – 15	$13 per set
16 – 25	$12 per set
more than 25	$8 per set

Linda bought 4 sets of greeting cards, Benjamin bought twice the number of sets she bought and Kelly bought 9 more sets of greetings cards than Benjamin.

(a) How much did each of them pay for their greeting cards?

(b) How much could they save if they bought the greeting cards together?

Answers: (a) Benjamin: _____

Linda: _____

Kelly: _____

(b) _____

Question 80

Eugene is 15 years old. His sister is $\frac{3}{5}$ his age. The ratio of his sister's age to their mother's age is 3 : 14.

(a) How much older is Eugene's mother than him?

(b) In how many years' time will Eugene's mother be twice his age?

Answers: (a) _____

(b) _____

Question 81

Machine A and machine B made pineapple tarts at a rate of 120 tarts per minute and 90 tarts per minute respectively. After $\frac{3}{4}$ hour, machine A was stopped until machine B made the same number of tarts as machine A. Machine A was then started again.

(a) How long was machine A stopped?

(b) How many more tarts could machine A produce if it was not stopped?

Answers: (a) _____

(b) _____

Question 82

Lydia spent $\frac{1}{3}$ of her money in a shop, gave $\frac{1}{6}$ of the remainder to her mother and saved the rest. If she bought 2 handbags that cost $74 each and a wallet that cost $56,

(a) how much more did Lydia save than spent?

(b) If Lydia saved another $136 more, what fraction of her money would she have saved?

Answers: (a) _____

(b) _____

Question 83

Samuel spent $\frac{1}{2}$ of his salary and gave $\frac{1}{3}$ of the remainder to his wife. His daughters, Beatrice, Felicia and Joyce shared the rest of the money in the ratio 1 : 3 : 2. If Felicia received $1080,

(a) what was Samuel's salary?

(b) How many percent more did Samuel spend than give to his wife?

Answers: (a) _____

(b) _____

Question 84

Tom spent $1650 in January, which was 40% of the salary he earned that month. He saved the rest of his salary. In February, his salary increased by 20% and he saved $190 more in February than in January.

(a) How much did he save in February?

(b) How much did he spend in February?

Answers: (a) _____

(b) _____

Question 85

A tank with a square base of sides 10 cm was $\frac{3}{4}$ filled with water. $\frac{1}{2}$ the amount of water was poured into an empty container filling it to the brim. $\frac{2}{3}$ of the amount of water in the container was poured into a basin which was already $\frac{1}{5}$ filled with 700 cm^3 of water. The basin then became $\frac{1}{2}$ full.

(a) What was the original water level in the tank?

(b) What was the height of the tank?

Answers: (a) _____

(b) _____

Question 86

Cleo wanted to buy 16 similarly priced T-shirts but she was $8 short. If she had bought 7 such T-shirts instead, she would have $19 left.

(a) What was the cost of 2 such T-shirts?

(b) How much money did Cleo have?

Answers: (a) _____

(b) _____

Question 87

Cindy spent $\frac{1}{7}$ of her money on food and $\frac{1}{3}$ on transport. $\frac{6}{11}$ of the remainder was given to her brother and the rest was saved. Her brother spent all the money on a watch and three similar books in the ratio 5 : 2. If each book cost $8,

(a) how much did Cindy spend on transport?

(b) how much did Cindy save?

Answers: (a) _____

(b) _____

Question 88

A container measures 18 cm by 22 cm by 30 cm. It is $\frac{1}{2}$ filled with water. Water from a jug is then poured into the container, increasing the volume of water in the container by $\frac{1}{3}$ its original volume.

(a) How much more water is needed to fill the container completely?

(b) After the water from the jug is added, water then flows from a tap at a rate of 660 cm^3 per minute into the container. How long will it take to fill up the container to the brim?

Answers: (a) _____

(b) _____

Question 89

Agnes gave $\frac{3}{7}$ of her money to charity and $\frac{5}{14}$ of her money to her son. Of the remainder, she spent \$20 on a watch and \$17 on a book. Her son spent \$24 and saved the rest. The amount of money he spent and saved was in the ratio 3 : 7.

(a) How much money had Agnes left in the end?

(b) How much money did Agnes have at first?

Answers: (a) _____

(b) _____

Question 90

Mrs Wise spent $\frac{1}{3}$ of her money in a shop. She bought a watch for \$180 and a necklace. She then gave $\frac{2}{5}$ of the remainder to her son who spent $\frac{1}{2}$ of the money on a pair of roller skates that cost \$150.

(a) How much had Mrs Wise left?

(b) How much did Mrs Wise spend on the necklace?

Answers: (a) _____

(b) _____

Question 91

Mark, Andrew and Dick shared a sum of money. Mark had \$480 more than Andrew. Dick had thrice as much as Mark. When Dick used \$600, the total amount of money that Dick and Andrew had was \$1500.

(a) How much did each boy have at first?

(b) How much did the boys have altogether?

Answers: (a) Andrew: _____

Mark: _____

Dick: _____

(b) _____

Question 92

Ryan and Sally shared some money. When Ryan gave Sally $\frac{1}{3}$ of his money, Sally had four times as much money as him. If they had a total of $297,

(a) how much did each of them have at first?

(b) how much more did Sally have than Ryan in the end?

Answers: (a) Ryan: _____

Sally: _____

(b) _____

Question 93

Carol spent 30% of her money on 3 blouses and 2 skirts which cost $288 altogether. Each blouse cost $\frac{2}{5}$ as much as a skirt.

(a) How much money did she have at first?

(b) How much more did a skirt cost than a blouse?

Answers: (a) _____

(b) _____

Question 94

Mr Crawford had a piece of land. 60% of it was used to build a house. $\frac{1}{4}$ of the remaining land was used to construct a garden. The perimeter of the garden was 96 m. If its length was 32 m,

(a) find the area of the original piece of land.

(b) How much bigger was the area used to build the house than the garden?

Answers: (a) _____

(b) _____

Question 95

Joanne has some money. She can buy either 15 pencils or 9 pens with all her money. She buys 10 pencils for $24 and some pens with the remaining amount of money.

(a) How much does a pen cost?

(b) How many pens does she buy?

Answers: (a) _____

(b) _____

Question 96

132 people went for dinner. $\frac{1}{2}$ of them paid \$40.60 each and $\frac{2}{3}$ of the remaining people paid \$50 each. The rest paid \$55.20 each. The organisers realised that they were still \$110 short.

(a) What was the total cost of the dinner?

(b) If everyone shared the cost of the dinner equally, how much would each person pay?

Answers: (a) _____

(b) _____

Question 97

Shawn, Jeffrey and Tony have some money. Shawn and Jeffrey have \$150 altogether. If Shawn receives \$30 more from his mother, he will have the same amount of money as Jeffrey and Tony will have $\frac{1}{3}$ of what Shawn has.

(a) How much money does Shawn have?

(b) How much money does Tony have?

Answers: (a) _____

(b) _____

Question 98

Andrew finished typing 8 similar sets of notes in 3 hours. If his typing speed increased to 60 words per minute, he would have finished typing the same sets of notes 2 hours faster.

(a) What was Andrew's original typing speed?

(b) If he wanted to finish 10 such sets of notes in 2.5 hours, how fast would he have to type per minute?

Answers: (a) _____

(b) _____

Question 99

The breadth of a rectangular tank was $\frac{1}{4}$ its length. The ratio of the length to its height was 7 : 3. When the tank was $\frac{1}{4}$ full, the height of the water level was 9 cm.

(a) Find the capacity of the tank.

(b) How long does it take for a tap that flows at 7 litres per minute to fill up the tank completely?
(Round off your answer to the nearest minute)

Answers: (a) _____

(b) _____

Question 100

20% of the cards in a box are red. The number of blue cards is $\frac{1}{4}$ the number of red cards. The remaining 150 cards are made up of green and white cards. There are $\frac{2}{3}$ as many green cards as white cards.

(a) What percentage of the cards in the box are green?

(b) How many cards are there altogether?

Answers: (a) _____

(b) _____

Question 101

The original price of a refrigerator was $1700. Sylvia bought it at a discount of 20% and had $\frac{4}{5}$ of her money left. She then spent 30% of the money left on a television.

(a) How much was the cost of the refrigerator after the discount?

(b) How much did Sylvia spend on the television?

Answers: (a) _____

(b) _____

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Solutions

Solution to Question 1

Step 1 : Find the total number of children when there were 24 groups and 25 groups

24 groups → 24 × 16 = 384

25 groups → 25 × 18 = 450

Step 2 : Find the number of children who formed the new group

450 – 384 = 66

Step 3 : Find the respective number of boys and girls in the new group

11 units → 66

1 unit → 66 ÷ 11
= 6

boys : girls
5 : 6
11 units

boys : 5 units → 5 × 6 = 30

girls : 6 units → 6 × 6 = 36

Step 4 : Find the number of girls at first

384 – 220 = 164

Step 5 : Find the number of boys and girls in the end

boys : 220 + 30 = 250

girls : 164 + 36 = 200

Step 6 : Find how many more boys than girls there were in the end

250 – 200 = 50

There were 50 more boys than girls in the end.

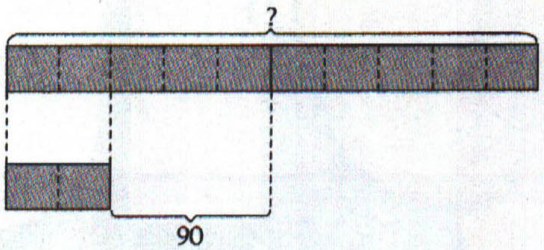
Answer: 50 more boys

Solution to Question 2

Step 1 : Draw a model

$\frac{1}{2} = \frac{5}{10}$

$\frac{1}{5} = \frac{2}{10}$



Step 2 : Find the value of 1 unit

3 units → 90

1 unit → 90 ÷ 3 = 30

Step 3 : Find the number

10 units → 10 × 30 = 300

The number is 300.

Answer: 300

Solution to Question 3

Step 1 : Find the cost of a set of 4 bouquets of orchids and 1 bouquet of roses

4 × $25 = $100

$100 + $30 = $130

Step 2 : Find the number of such sets of flowers the florist has to sell in order to earn $390

$390 ÷ $130 = 3 sets

Step 3 : Find the number of orchids and roses the florist sells

orchids: 4 bouquets × 20 = 80

3 sets × 80 = 240

roses: 1 bouquet × 10 = 10

3 sets × 10 = 30

Step 4 : Find the total number of flowers the florist sells altogether

240 + 30 = 270

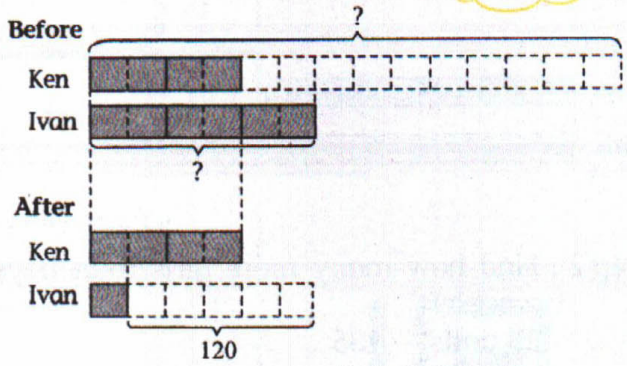
She sells 270 flowers altogether.

Answer: 270 flowers

Solution to Question 4

Step 1 : Draw a model

$\frac{5}{7} = \frac{10}{14}$



Step 2 : Find the value of 1 unit

5 units → 120

1 unit → 120 ÷ 5 = 24

Step 3 : Find the number of sweets Ivan and Ken had at first

Ivan : 6 units → 6 × 24 = 144

Ivan had 144 sweets at first.

Ken : 14 units → 14 × 24 = 336

Ken had 336 sweets at first.

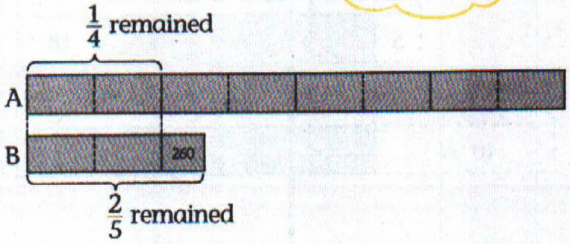
Answers: Ivan: 144 sweets

Ken: 336 sweets

Solution to Question 5

Step 1 : Draw models to compare the number of guests in the two hotels

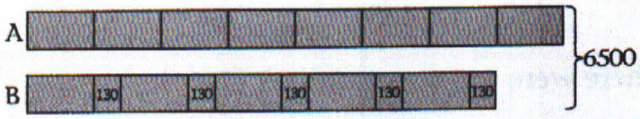
A : $\frac{3}{4} = \frac{6}{8}$



Step 2 : Re-draw the model to compare the units

B : $\frac{2}{5}$ of guests = 2 units + 260

$\frac{1}{5}$ of guests = 1 + 130



Step 3 : Find the number of guests in Hotel A

130 × 5 = 650

13 units → 6500 – 650 = 5850

1 unit → 5850 ÷ 13 = 450

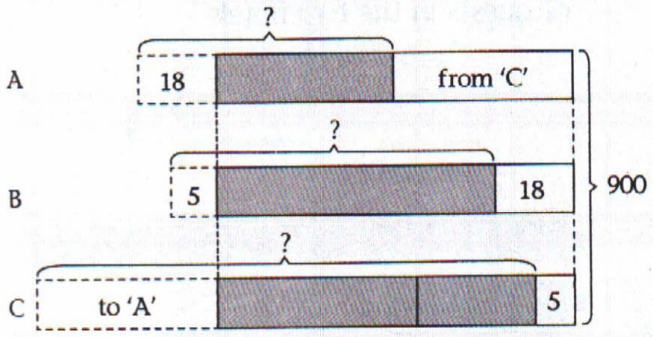
8 units → 8 × 450 = 3600

Hotel A had 3600 guests at first.

Answer: 3600 guests

Solution to Question 6

Step 1 : Draw a model



Step 2 : Find the number of sweets in each box in the end

$900 \div 3 = 300$

Step 3 : Find the number of sweets in box C at first

$300 \div 2 = 150$

$3 \times 150 = 450$

$450 - 5 = 445$

There were 445 sweets in box C at first.

Step 4 : Find the number of sweets in box B at first

$300 - 18 = 282$

$282 + 5 = 287$

There were 287 sweets in box B at first.

Step 5 : Find the number of sweets in box A at first

$300 - 150 = 150$

$150 + 18 = 168$

There were 168 sweets in box A at first.

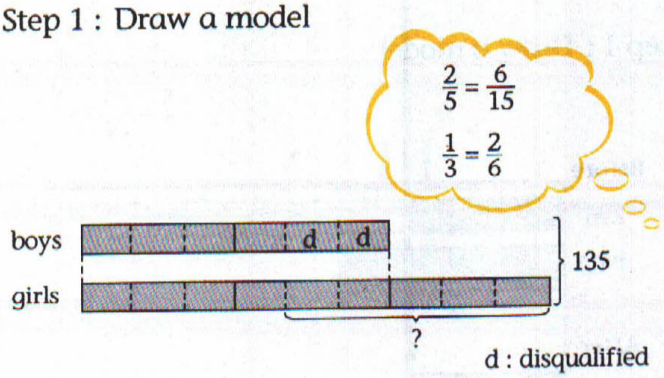
Answers: Box A: 168 sweets

Box B: 287 sweets

Box C: 445 sweets

Solution to Question 7

Step 1 : Draw a model



Step 2 : Find how many more girls than boys were left

15 units → 135

1 unit → $135 \div 15 = 9$

5 units → $5 \times 9 = 45$

45 more girls than boys were left.

Answer: 45 more girls

Solution to Question 8

Step 1 : Find the fraction of lemons in 1 bag and 1 container

1 bag:

$\frac{1}{2} \div 5 = \frac{1}{2} \times \frac{1}{5}$

$= \frac{1}{10}$ of the total number of lemons

1 container:

$\frac{1}{2} \div 6 = \frac{1}{2} \times \frac{1}{6}$

$= \frac{1}{12}$ of the total number of lemons

Step 2 : Find the fraction of lemons in 3 containers and 1 bag

3 containers: $\frac{1}{12} \times 3 = \frac{1}{4}$

3 containers and 1 bag: $\frac{1}{4} + \frac{1}{10}$

$= \frac{10}{40} + \frac{4}{40}$

$= \frac{14}{40}$

Step 3 : Find the total number of lemons

Total = 40 units

14 units → 63

1 unit → $63 \div 14 = 4.5$

40 units → $40 \times 4.5 = 180$

Mrs Walker had 180 lemons.

Answer: 180 lemons

Solution to Question 9

Step 1 : Draw a model

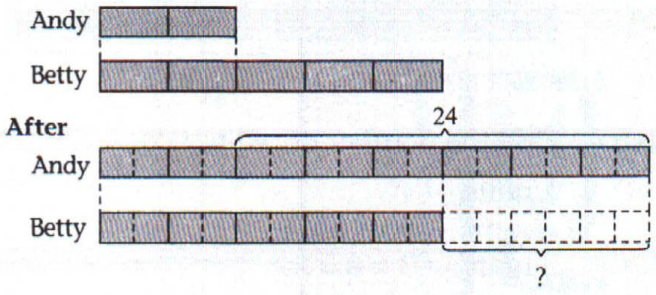
Andy : Betty

2 : 5 (× 2)

4 : 10 (× 2)

16 : 10 (After Andy bought 24 more biscuits)

Before



After

Step 2 : Find the number of biscuits Betty had to buy

12 units → 24

1 unit → 24 ÷ 12 = 2

6 units → 6 × 2 = 12

Step 3: Find the number of packs of biscuits Betty had to buy

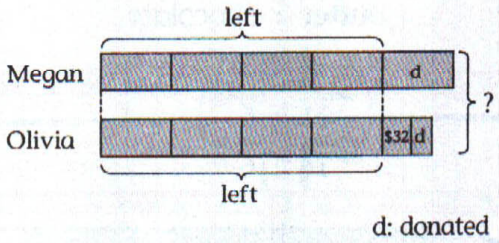
12 ÷ 6 = 2

Betty would have to buy 2 packs of biscuits so that they would have the same number of biscuits in the end.

Answer: 2 packs of biscuits

Solution to Question 10

Step 1 : Draw a model



d: donated

Step 2 : Find the amount Megan donated

$100 – $24 = $76

1 unit → $76

Step 3 : Find the total amount of money at first

9 units → 9 × $76 = $684

$684 + $24 + $32 = $740

The sum of money was $740.

Answer: $740

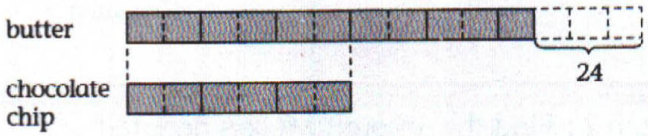
Solution to Question 11

Step 1 : Draw a model

butter : chocolate

7 : 3 (×2) → 11 : 6 (×2) → 14 : 6

*number of chocolate chip cookies must remain the same



Step 2 : Find the number of butter cookies left

3 units → 24

1 unit → 24 ÷ 3 = 8

11 units → 11 × 8 = 88

Step 3 : Find the number of chocolate chip cookies

6 units → 6 × 8 = 48

Step 4 : Find the number of bags used for each type of cookies

Butter cookies: 88 ÷ 4 = 22

Chocolate chip cookies: 48 ÷ 4 = 12

She had 22 bags of butter cookies and 12 bags of chocolate chip cookies.

Answers: 22 bags of butter cookies

12 bags of chocolate chip cookies

Solution to Question 12

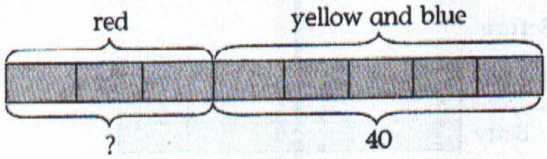
Step 1 : Find the number of yellow toy cars

26 – 12 = 14

Step 2 : Find the total number of blue and yellow toy cars

26 + 14 = 40

Step 3 : Draw a model



Step 4 : Find the number of red toy cars

5 units → 40

1 unit → 40 ÷ 5 = 8

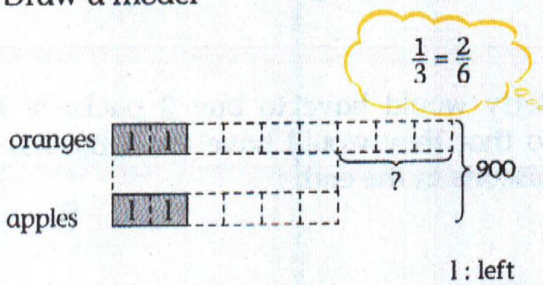
3 units → 3 × 8 = 24

There were 24 red toy cars.

Answer: 24 red toy cars

Solution to Question 13

Step 1 : Draw a model



Step 2 : Find how many more oranges than apples there were

15 units → 900

1 unit → 900 ÷ 15 = 60

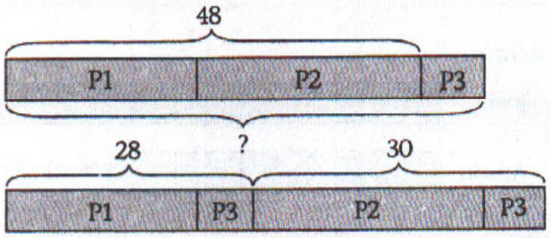
3 units → 3 × 60 = 180

There were 180 more oranges than apples at first.

Answer: 180 more oranges

Solution to Question 14

Step 1 : Draw a model



Step 2 : Find the entries from P3

28 + 30 = 58

P1 + P2 + 2 units of P3 = 58

2 units of P3 = 58 – 48

= 10

1 unit of P3 = 10 ÷ 2

= 5

Step 3 : Find the total number of entries

48 + 5 = 53

There were 53 entries altogether.

Answer: 53 entries

Solution to Question 15

Step 1 : Find the percentage of Chinese students in the kindergarten

100% – 12% = 88%

Step 2 : Find the number of Chinese students

88% – 12% = 76%

76% → 912

1% → 912 ÷ 76 = 12

88% → 88 × 12 = 1056

Step 3 : Find the number of Malay students

1056 – 912 = 144

Step 4 : Find the number of Chinese girls

100% → 1056

50% → 1056 ÷ 2 = 528

Step 5 : Find the number of Malay girls

100% – 12.5% = 87.5%

100% → 144

1% → 144 ÷ 100 = 1.44

87.5% → 87.5 × 1.44 = 126

Step 6 : Find the total number of girls in the kindergarten

528 + 126 = 654

There are 654 girls in the kindergarten.

Answer: 654 girls

Solution to Question 16

Step 1 : Compare the ratios

$\frac{1}{4} \times 12 = 3$

$\frac{1}{2} \times 20 = 10$

oranges : papayas

3 : 5 (× 4) → 12 : 20 (× 4)

(– 3) → 9 : 10 (– 10)

(1 unit more papayas than oranges)

Step 2 : Find the number of oranges in the basket at first

1 unit → 16

12 units → 12 × 16 = 192

Step 3 : Find the number of papayas in the basket at first

20 units → 20 × 16 = 320

There are 192 oranges and 320 papayas in the basket at first.

Answers: 192 oranges

320 papayas

Solution to Question 17

Step 1 : Compare the ratios

Terence : Cynthia

$\times 3$ (5 : 9) $\times 3$

reduced by 5 units (15 : 27)

(10 : 27)

Step 2 : Find the number of balloons that Terence had at first

5 units → 15

1 unit → 15 ÷ 5 = 3

15 units → 15 × 3 = 45

Step 3 : Find the number of balloons that Cynthia had at first

27 units → 27 × 3 = 81

Terence had 45 balloons and Cynthia had 81 balloons at first.

Answers: Terence: 45 balloons

Cynthia: 81 balloons

Solution to Question 18

Step 1 : Find the percentage of pears

100% – 60% = 40%

Step 2 : Find the percentage of fruit that were not sold

Pears: 100% – 70% = 30%

Oranges: 100% – 40% = 60%

Step 3 : Find the total percentage of fruit that were not sold

Pears: $\frac{30}{100} \times 40\% = 12\%$

Oranges: $\frac{60}{100} \times 60\% = 36\%$

12% + 36% = 48%

Step 4 : Find the total number of fruit he had at first

48% → 240

1% → 240 ÷ 48 = 5

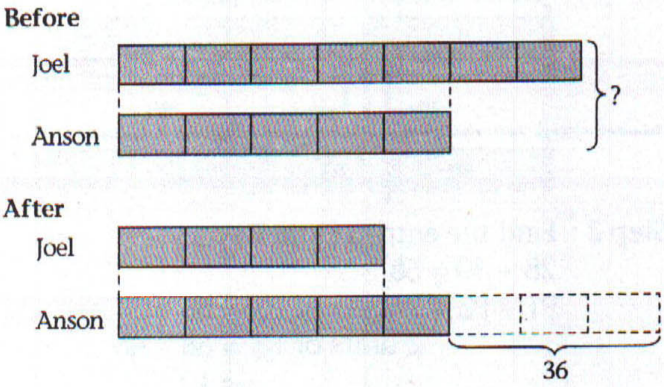
100% → 100 × 5 = 500

Mr Willis had 500 fruit at first.

Answer: 500 fruit

Solution to Question 19

Step 1 : Draw a model



Step 2 : Find the total number of marbles they have

3 units → 36

1 unit → 36 ÷ 3 = 12

12 units → 12 × 12 = 144

They have 144 marbles altogether.

Answer: 144 marbles

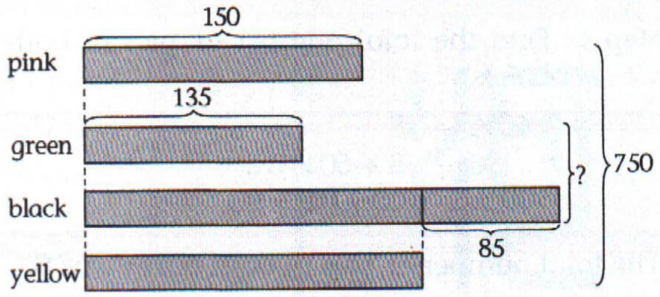
Solution to Question 20

Step 1 : Find the number of pink and green shirts

Pink shirts: $\frac{20}{100} \times 750 = 150$

Green shirts: $\frac{18}{100} \times 750 = 135$

Step 2 : Draw a model



Step 3 : Find the number of yellow shirts

$750 - 150 - 135 - 85 = 380$

2 units → 380

1 unit → $380 \div 2 = 190$

Step 4 : Find the number of black shirts

$190 + 85 = 275$

Step 5 : Find the number of black and green shirts

$275 + 135 = 410$

The total number of black and green shirts in the box was 410.

Answer: 410 black and green shirts

Solution to Question 21

Step 1 : Find the number of apples in baskets A and B

A and B	:	C
6	:	2

2 parts → 112

1 part → $112 \div 2 = 56$

6 parts → $6 \times 56 = 336$

Step 2 : Find the value of 1 unit

A	:	B
5	:	3

8 units → 336

1 unit → $336 \div 8 = 42$

Step 3 : Find how many more apples there are in A than in B

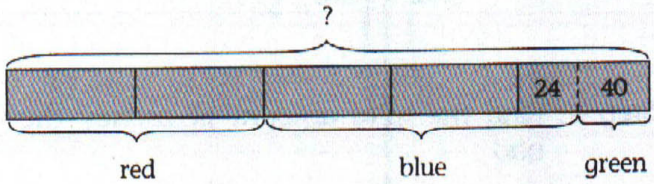
2 units → $2 \times 42 = 84$

There are 84 more apples in A than in B.

Answer: 84 more apples

Solution to Question 22

Step 1 : Draw a model



Step 2 : Find the value of 1 unit

$24 + 40 = 64$

Step 3 : Find the total number of rubber bands

1 unit → 64

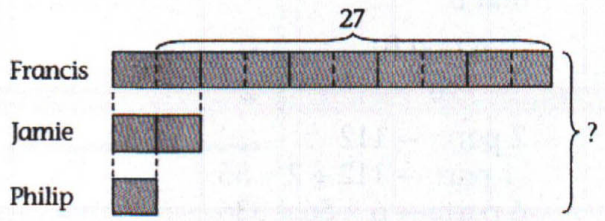
5 units → $5 \times 64 = 320$

There were 320 rubber bands altogether.

Answer: 320 rubber bands

Solution to Question 23

Step 1 : Draw a model



Step 2 : Find the number of coins each of them had

9 units → 27 coins

Philip: 1 unit → 27 ÷ 9 = 3 coins

Jamie: 2 units → 2 × 3 = 6 coins

Francis: 10 units → 10 × 3 = 30 coins

Step 3 : Find the amount of money each of them had

100¢ = $1

Philip: 3 × 50¢ = 150¢
= $1.50

Jamie: 6 × $1 = $6

Francis: 30 × 20¢ = 600¢
= $6

Step 4 : Find the total amount of money they had

$1.50 + $6 + $6 = $13.50

They had $13.50 altogether.

Answer: $13.50

Solution to Question 24

Step 1 : Find the percentage of pies in box B

100% – 40% = 60%

Step 2 : Find the number of pies in box B

100% – 75% = 25% (of the total in box B)

25% → 12

1% → 12 ÷ 25 = 0.48

100% → 100 × 0.48 = 48

There are 48 pies in box B.

Step 3 : Find the total number of pies in both boxes

60% → 48

1% → 48 ÷ 60 = 0.8

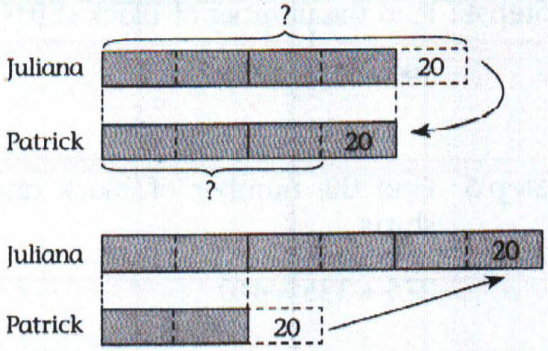
100% → 100 × 0.8 = 80

The total number of pies in both boxes was 80.

Answer: 80 pies

Solution to Question 25

Step 1 : Draw a model



Step 2 : Find the number of marbles each of them had

1 unit → 20

Juliana: 5 units → 5 × 20 = 100

Patrick: 3 units → 3 × 20 = 60

Juliana had 100 marbles and Patrick had 60 marbles.

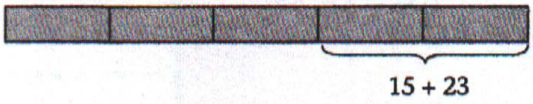
Answers: Juliana: 100 marbles

Patrick: 60 marbles

Solution to Question 26

Step 1 : Draw a model

(Sunday)



Step 2 : Find the number of cookies left in the box on Sunday

2 units → 15 + 23 = 38

1 unit → 38 ÷ 2 = 19

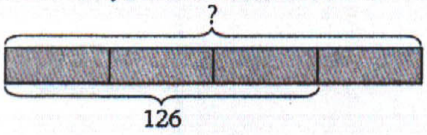
3 units → 3 × 19 = 57

Step 3 : Find the number of cookies she put into the box on Monday

183 – 57 = 126

Step 4 : Find the number of cookies Mrs Campbell baked on Monday

(Monday)



3 units → 126

1 unit → 126 ÷ 3 = 42

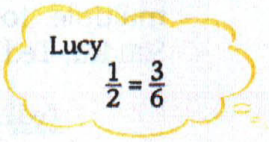
4 units → 4 × 42 = 168

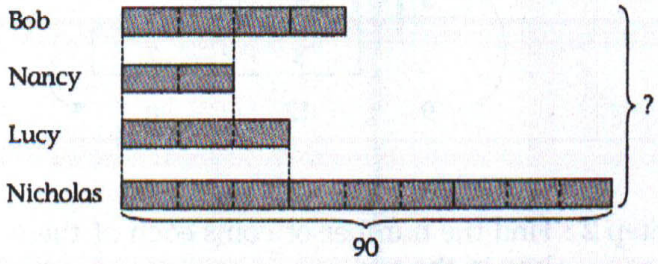
Mrs Campbell baked 168 cookies on Monday.

Answer: 168 cookies

Solution to Question 27

Step 1 : Draw a model





Step 2 : Find the total number of sweets in the bag

9 units → 90 sweets

1 unit → 90 ÷ 9 = 10 sweets

18 units → 18 × 10 = 180 sweets

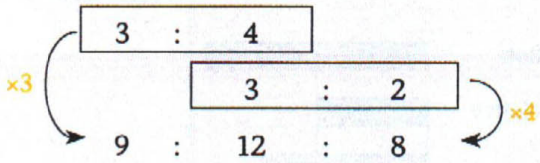
There were 180 sweets in the bag.

Answer: 180 sweets

Solution to Question 28

Step 1 : Use the number, 12, as the common multiple to find the ratio of coins Sandra, Ted and Justina had

Ted : Sandra : Justina



Step 2 : Find the number of coins each of them had in the end

$9 + 12 + 8 = 29$

29 units → 377

1 unit → $377 \div 29 = 13$

Sandra: 12 units → $12 \times 13 = 156$

Ted: 9 units → $9 \times 13 = 117$

Justina: 8 units → $8 \times 13 = 104$

Step 3 : Find the number of coins each of them had at first

Sandra: $156 + 15 = 171$

Ted: $117 - 13 = 104$

Justina: $104 - 15 = 89$

$89 + 13 = 102$

Sandra had 171 coins, Ted had 104 coins and Justina had 102 coins at first.

Answers: Sandra: 171 coins

Ted: 104 coins

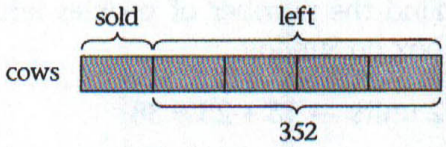
Justina: 102 coins

Solution to Question 29

Step 1 : Find the number of cows and the number of goats left

$704 \div 2 = 352$

Step 2 : Find how many cows and goats were there at first

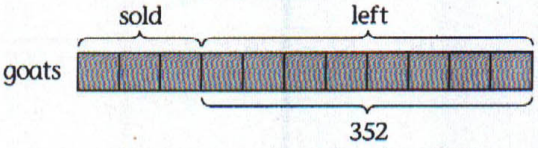


4 units → 352

1 unit → $352 \div 4 = 88$

5 units → $5 \times 88 = 440$

There were 440 cows at first.



8 units → 352

1 unit → 44

11 units → $11 \times 44 = 484$

There were 484 goats at first.

Step 3 : Find the total number of animals on the farm at first

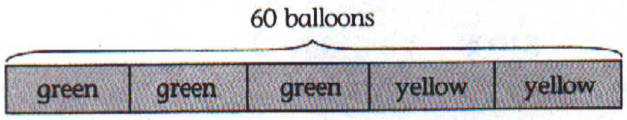
$484 + 440 = 924$

There were 924 animals on the farm at first.

Answer: 924 animals

Solution to Question 30

Step 1 : Draw a model



Step 2 : Find the number of green balloons

$\frac{3}{5} \times 60 = 36$

Step 3 : Find the number of yellow balloons

$60 - 36 = 24$

Step 4 : Find the number of remaining green and yellow balloons

Green balloons: $36 - 6 = 30$

Yellow balloons: $24 - 3 = 21$

Step 5 : Find the fraction of the remaining green balloons

$30 + 21 = 51$

$$\frac{\text{Number of remaining green balloons}}{\text{Total number of remaining balloons}}$$

$= \frac{30}{51}$

$= \frac{10}{17}$

$\frac{10}{17}$ of the remaining balloons were green.

Answer: $\frac{10}{17}$

Solution to Question 31

Step 1 : Find the cost of each set of cups

Each cup → \$8.90

Each set → 5 cups
= 5 × \$8.90
= \$44.50

Ratio of cups sold:

set	:	single
2	:	1

Step 2 : Find the cost of 2 sets and a single cup

2 sets and a single cup
= (2 × \$44.50) + \$8.90
= \$89.00 + \$8.90
= \$97.90

Step 3 : Find the number of groups of 2 sets and a single cup

\$1174.80 ÷ \$97.90 = 12 groups

Step 4 : Find the total number of cups in sets

12 groups (2 sets and 1 cup)
= (12 × 2 sets) + (12 × 1 cup)
= 24 sets + 12 cups

24 sets = (24 × 5 cups) + (24 free cups)
= 120 cups + 24 free cups
= 144 cups

Step 5 : Find the total number of cups in the box

144 + 12 = 156

There were 156 cups in the box at first.

Answer: 156 cups

Solution to Question 32

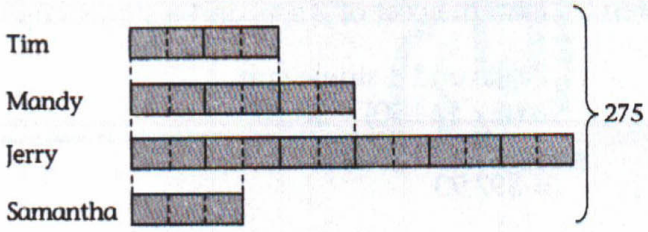
Step 1 : Find the total points scored by the four children

$4 \times 68.75 = 275$

$\frac{2}{3} = \frac{4}{6}$

$\frac{1}{2} = \frac{6}{12}$

Step 2 : Draw a model



Step 3 : Find the total points scored by Mandy and Samantha

25 units → 275

1 unit → 275 ÷ 25 = 11

9 units → 9 × 11 = 99

Step 4 : Find the average score of Mandy and Samantha

$99 \div 2 = 49.5$

The average score of Mandy and Samantha was 49.5.

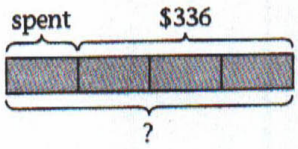
Answer: 49.5

Solution to Question 33

Step 1 : Find the amount of money each person had left

$\$1008 \div 3 = \$336$

Step 2 : Find the amount of money Jane had at first



3 units → $336

1 unit → $336 ÷ 3 = $112

4 units → 4 × $112 = $448

Jane had $448 at first.

Step 3 : Find the amount of money Alice had at first

$\$336 + \$80 = \$416$

Alice had $416 at first.

Step 4 : Find the amount of money Peter had at first

$2 \times \$336 = \$672$

Peter had $672 at first.

Answers: Jane: $448

Alice: $416

Peter: $672

Solution to Question 34

Step 1 : Find the volume of water released by both pumps per minute

Half a litre = 500 ml
= 500 cm^3

2 minutes → 500 cm^3

1 minute → 500 cm^3 ÷ 2 = 250 cm^3

Step 2 : Find the volume of water released by both pumps per minute

Pump A	:	Pump B
3	:	2

5 units → 250 cm^3/min

1 unit → 250 cm^3/min ÷ 5
= 50 cm^3/min

Pump A: 3 units → 3 × 50 cm^3/min
= 150 cm^3/min

Pump B: 2 units → 2 × 50 cm^3/min
= 100 cm^3/min

Step 3 : Find the volume of water in the tank

20 cm × 15 cm × 30 cm = 9000 cm^3

Step 4 : Find how long Pump B will take

Water in Pump B flows at:

100 cm^3 → 1 minute

9000 cm^3 → 9000 ÷ 100 = 90 minutes

It will take Pump B 90 minutes.

Answer: 90 minutes

Solution to Question 35

Step 1 : Find the total cost of the book, toy and hat

3 × $32 = $96

Step 2 : Find the cost of the book

book	:	toy	:	hat
5	:	2	:	9

5 + 2 + 9 = 16 units

1 unit → $96 ÷ 16 = $6

5 units → 5 × $6 = $30

Step 3 : Find the total cost of the belt, book, toy and hat

4 × $30 = $120

Step 4 : Find the cost of the belt

$120 – $96 = $24

Step 5 : Find the difference between the cost of the book and the belt

$30 – $24 = $6

The difference between the cost of the book and the belt is $6.

Answer: $6

Solution to Question 36

Step 1 : Find the breadth of the rectangle

AC = HE = 30 cm

CE = AH = 30 cm ÷ 5 = 6 cm

Step 2 : Find the area of BCD

CD = 6 cm ÷ 2 = 3 cm

Area of BCD = $\frac{1}{2}$ × Base × Height

= $\frac{1}{2}$ × 12 cm × 3 cm

= 18 cm^2

Step 3 : Find the area of BFG

HF = 30 cm – 12 cm = 18 cm

GF = 18 cm ÷ 2 = 9 cm

Area of BFG = $\frac{1}{2}$ × Base × Height

= $\frac{1}{2}$ × 9 cm × 6 cm

= 27 cm^2

Step 4 : Find the area of ACEH

Area of ACEH = Length × Breadth

= 30 cm × 6 cm

= 180 cm^2

Step 5 : Find the total area of the shaded portions

180 cm^2 – 27 cm^2 – 18 cm^2 = 135 cm^2

The total area of the shaded portions is 135 cm^2.

Answer: 135 cm^2

Solution to Question 37

Step 1 : Find the fraction of flour used to bake a cherry pie

Cherry pie : $\frac{1}{4} \div 6 = \frac{1}{4} \times \frac{1}{6} = \frac{1}{24}$

Step 2 : Find the fraction of flour packed in a bag

Bag of flour : $\frac{3}{4} \div 9 = \frac{3}{4} \times \frac{1}{9} = \frac{3}{36} = \frac{1}{12}$

Step 3 : Find the fraction of flour for 2 similar bags

2 bags of flour: $\frac{1}{12} \times 2 = \frac{1}{6}$

Step 4 : Find the mass of flour

$\frac{1}{6} - \frac{1}{24} = \frac{4}{24} - \frac{1}{24}$

$= \frac{3}{24}$

$= \frac{1}{8}$

$\frac{1}{8} \rightarrow 250$ g

$\frac{8}{8} \rightarrow 8 \times 250$ g $= 2000$ g

Step 5 : Find the mass of flour in each bag

2000 g ÷ 25 = 80 g

There would be 80 g of flour in each bag.

Answer: 80 g of flour

Solution to Question 38

Step 1 : Find the total mass of the 3 bags when they are full

$3 \times 38 \text{ kg} = 114 \text{ kg}$

Step 2 : Find the mass of items in bag A

$3 \times 30 \text{ kg} = 90 \text{ kg}$
$114 \text{ kg} - 90 \text{ kg} = 24 \text{ kg}$

Step 3 : Find the total mass of items in bags B and C

Bag B : Bag C
7 : 3
7 units – 3 units = 4 units
4 units → 20 kg
1 unit → 20 kg ÷ 4 = 5 kg
10 units → 10 × 5 kg = 50 kg

Step 4 : Find the total mass of the 3 bags when they are empty

$50 \text{ kg} + 24 \text{ kg} = 74 \text{ kg}$
$114 \text{ kg} - 74 \text{ kg} = 40 \text{ kg}$

The total mass of the 3 bags is 40 kg when they are empty.

Answer: 40 kg

Solution to Question 39

Step 1 : Find the amount of sand poured into the container

$\frac{1}{5} \times 2520 \text{ cm}^3 = 504 \text{ cm}^3$

Step 2 : Find the total amount of sand in the container

$504 \text{ cm}^3 + 7112 \text{ cm}^3 = 7616 \text{ cm}^3$

Step 3 : Find the base area of the container

$16 \text{ cm} \times 28 \text{ cm} = 448 \text{ cm}^2$

Step 4 : Find the height of the sand in the container in the end

$7616 \text{ cm}^3 \div 448 \text{ cm}^2 = 17 \text{ cm}$

The height of the sand in the container was 17 cm in the end.

Answer: 17 cm

Solution to Question 40

Step 1 : Find the area of shaded portion in the rectangle ABEG

shaded : unshaded
5 : 3
8 units

8 units → 152 cm²
1 unit → 152 cm² ÷ 8 = 19 cm²
5 units → 5 × 19 cm² = 95 cm²

Step 2 : Find the area of the unshaded triangle CDE

$\frac{1}{4} \times 152 \text{ cm}^2 = 38 \text{ cm}^2$

Step 3 : Find the area of the unshaded triangle AGF

3 units → 3 × 19 cm² = 57 cm²

Step 4 : Find the area of the shaded triangle BCE

Area of ΔBCE : Area of ΔAGF
3 : 2
2 units → 57 cm²
1 unit → 57 cm² ÷ 2 = 28.5 cm²
3 units → 3 × 28.5 cm² = 85.5 cm²

Step 5 : Find the difference between the area of shaded and unshaded portions of the figure

Total area of the shaded portions
= 95 cm² + 85.5 cm² = 180.5 cm²

Total area of the unshaded portions
= 57 cm² + 38 cm² = 95 cm²

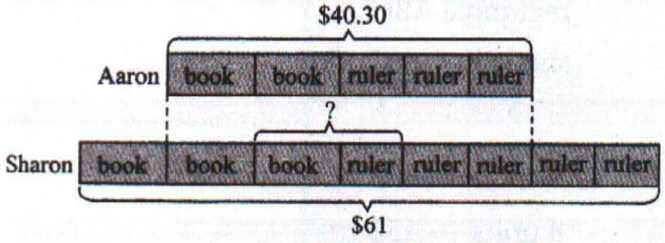
180.5 cm² – 95 cm²= 85.5 cm²

The difference between the area of the shaded portions and the unshaded portions of the figure is 85.5 cm².

Answer: 85.5 cm²

Solution to Question 41

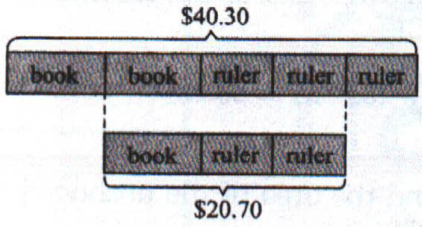
Step 1 : Draw a model



Step 2 : Find the cost of a book and 2 rulers

$\$61 - \$40.30 = \$20.70$

Step 3 : Draw another model



Step 4 : Find the cost of a book and a ruler

$\$40.30 - \$20.70 = \$19.60$

The cost of a book and a ruler was $19.60.

Answer: $19.60

Solution to Question 42

Step 1 : Find the volume of water in the tank

$12 \text{ cm} \times 16 \text{ cm} \times 24 \text{ cm} = 4608 \text{ cm}^3$

$\frac{2}{3} \times 4608 \text{ cm}^3 = 3072 \text{ cm}^3$

Step 2 : Find the volume of water poured into the basin

$3072 \text{ cm}^3 \div 2 = 1536 \text{ cm}^3$

Step 3 : Find the capacity of the basin

2 units → 1536 cm^3

1 unit → $1536 \text{ cm}^3 \div 2 = 768 \text{ cm}^3$

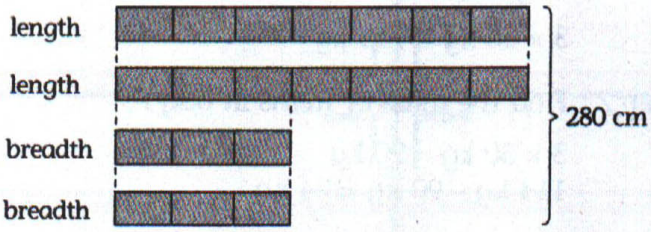
5 units → $5 \times 768 \text{ cm}^3 = 3840 \text{ cm}^3$

The capacity of the basin is 3840 cm^3.

Answer: 3840 cm^3

Solution to Question 43

Step 1 : Draw a model



Step 2 : Find the length and breadth

$280 \text{ cm} \div 20 = 14 \text{ cm}$

Length: $7 \times 14 \text{ cm} = 98 \text{ cm}$

Breadth: $3 \times 14 \text{ cm} = 42 \text{ cm}$

Step 3 : Find the area of rectangle

$\text{Area of rectangle} = \text{Length} \times \text{Breadth}$

$= 98 \text{ cm} \times 42 \text{ cm}$

$= 4116 \text{ cm}^2$

Step 4: Find the area of triangle

$\text{Base of triangle} = 98 \text{ cm} \div 2$

$= 49 \text{ cm}$

$\text{Area of triangle} = \frac{1}{2} \times \text{Base} \times \text{Height}$

$= \frac{1}{2} \times 49 \text{ cm} \times 42 \text{ cm}$

$= 1029 \text{ cm}^2$

Step 5 : Find the area of the shaded portion

$4116 \text{ cm}^2 - 1029 \text{ cm}^2 = 3087 \text{ cm}^2$

The area of the shaded portion is 3087 cm^2.

Answer: 3087 cm^2

Solution to Question 44

Step 1 : Find the unknown lengths

$GF = \frac{2}{5} \times 12 \text{ cm} = 4.8 \text{ cm}$

$JG = \frac{2}{5} \times 18 \text{ cm} = 7.2 \text{ cm}$

$GF = \frac{3}{5} \times HF$

$HF = GF \div \frac{3}{5} = 4.8 \text{ cm} \times \frac{5}{3} = 8 \text{ cm}$

$EC = \frac{1}{2} \times 18 \text{ cm} = 9 \text{ cm}$

$BF = BG + GF = 12 \text{ cm} + 4.8 \text{ cm} = 16.8 \text{ cm}$

Step 2 : Find the respective areas in the figure

Area of $\Delta ABF = \frac{1}{2} \times \text{Base} \times \text{Height}$
$= \frac{1}{2} \times AF \times BF$
$= \frac{1}{2} \times 18 \text{ cm} \times 16.8 \text{ cm}$
$= 151.2 \text{ cm}^2$

Area of $\Delta ECD = \frac{1}{2} \times EC \times ED$
$= \frac{1}{2} \times 9 \text{ cm} \times 10 \text{ cm}$
$= 45 \text{ cm}^2$

Area of $\Delta HCF = \frac{1}{2} \times HF \times FC$
$= \frac{1}{2} \times 8 \text{ cm} \times 18 \text{ cm}$
$= 72 \text{ cm}^2$

Area of $\Delta BGJ = \frac{1}{2} \times BG \times JG$
$= \frac{1}{2} \times 12 \text{ cm} \times 7.2 \text{ cm}$
$= 43.2 \text{ cm}^2$

Step 3 : Find the area of whole figure

Area of whole figure
$= \Delta ABF + \Delta HCF + \Delta ECD$
$= 151.2 \text{ cm}^2 + 72 \text{ cm}^2 + 45 \text{ cm}^2$
$= 268.2 \text{ cm}^2$

Step 4 : Find the total area of the shaded portions

Area of the total shaded portions
$= 268.2 \text{ cm}^2 - 43.2 \text{ cm}^2 = 225 \text{ cm}^2$

The total area of the shaded portions is 225 cm^2.

Answer: 225 cm^2

Solution to Question 45

Step 1 : Find the volume of water in the tank when it is $\frac{3}{5}$ filled

$25 \text{ cm} \times 18 \text{ cm} \times 30 \text{ cm} = 13\,500 \text{ cm}^3$

$\frac{3}{5} \times 13\,500 \text{ cm}^3 = 8100 \text{ cm}^3$

Step 2 : Find the volume of water in the tank when it is half-full

$13\,500 \text{ cm}^3 \div 2 = 6750 \text{ cm}^3$

Step 3 : Find the volume of water left in the tank when some water was taken out to fill the two containers

$6750 \text{ cm}^3 - 950 \text{ cm}^3 = 5800 \text{ cm}^3$

Step 4 : Find the volume of water poured into the 2 similar containers

$8100 \text{ cm}^3 - 5800 \text{ cm}^3 = 2300 \text{ cm}^3$

Step 5 : Find the capacity of each container

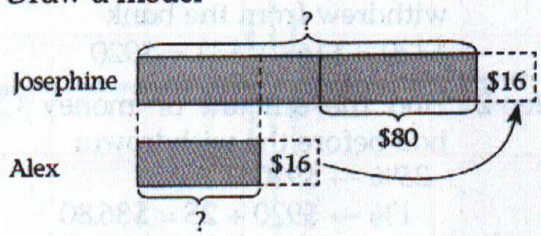
$2300 \text{ cm}^3 \div 2 = 1150 \text{ cm}^3$

The capacity of each container is 1150 cm^3.

Answer: 1150 cm^3

Solution to Question 46

Step 1 : Draw a model



Step 2 : Find how much more money Josephine had than Alex in the end

$\$80 + \$16 + \$16 = \$112$

Step 3 : Find the amount of money Josephine had in the end (from the model)

2 units → \$112
1 unit → $\$112 \div 2 = \$56$
3 units → $3 \times \$56 = \$168$

Step 4 : Find the amount of money Josephine had at first

$\$168 - \$16 = \$152$

Step 5 : Find the amount of money Alex had at first

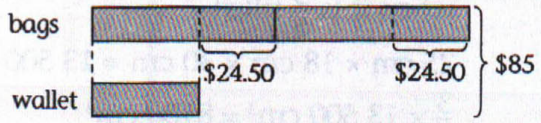
$\$56 + \$16 = \$72$

Josephine had \$152 and Alex had \$72 at first.

Answers: Josephine: \$152
Alex: \$72

Solution to Question 47

Step 1 : Draw a model



Step 2 : Find the cost of a wallet

$2 \times \$24.50 = \$49$

$\$85 - \$49 = \$36$

$\$36 \div 3 = \$12$

Step 3 : Find the cost of a bag

$\$12 + \$24.50 = \$36.50$

Step 4 : Find the total cost of 3 wallets and 3 bags

3 wallets → $3 \times \$12 = \$36$

3 bags → $3 \times \$36.50 = \$109.50$

$\$36 + \$109.50 = \$145.50$

The total cost of 3 wallets and 3 bags is $145.50.

Answer: $145.50

Solution to Question 48

Step 1 : Find the amount of money Clarence withdrew from the bank

$\$720 + \$163 + \$37 = \$920$

Step 2 : Find the amount of money Clarence had before the withdrawal

25% → $920

1% → $\$920 \div 25 = \$36.80$

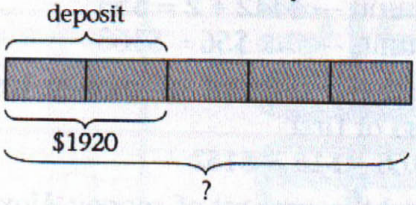
100% → $100 \times \$36.80 = \$3680$

Step 3 : Find the amount of money he deposited after receiving his salary

$\$3680 - \$920 = \$2760$

$\$4680 - \$2760 = \$1920$

Step 4 : Find Clarence's salary



2 units → $1920

1 unit → $\$1920 \div 2 = \$960$

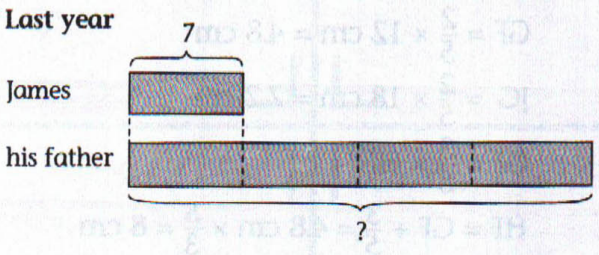
5 units → $5 \times \$960 = \$4800$

Clarence's salary was $4800.

Answer: $4800

Solution to Question 49

Step 1 : Draw a model



Step 2 : Find the age of his father last year

$4 \times 7 = 28$

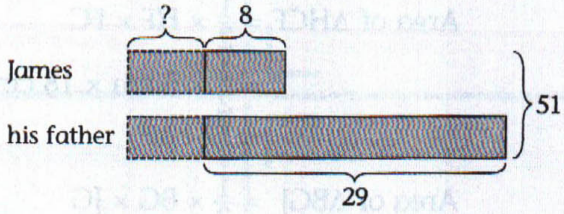
Step 3 : Find the difference between James' and his father's present age

His father's present age:

28 + 1 = 29 years old

Difference → 29 – 8 = 21 years

Step 4 : Find the number of years to reach a combined age of 51



2 units → 51 – 8 – 29 = 14

1 unit → 14 ÷ 2 = 7

Their combined age will be 51 in 7 years' time.

Answer: 7 years' time

Solution to Question 50

Step 1 : Find the amount of money Joan paid in total

$12 \times \$250 = \$3000$

$\$3000 + \$399 = \$3399$

Step 2 : Find the price Anna paid for the refrigerator

Since it is 10% more, total will be 110%

$110\% \rightarrow \$3399$

$1\% \rightarrow \$3399 \div 110 = \$30.90$

$100\% \rightarrow 100 \times \$30.90 = \$3090$

Step 3 : Find the price of the refrigerator before the sale

$100\% - 20\% = 80\%$

$80\% \rightarrow \$3090$

$1\% \rightarrow \$3090 \div 80$

$= \$38.625$

$100\% \rightarrow 100 \times \$38.625$

$= \$3862.50$

The original price of the refrigerator before the sale was $3862.50.

Answer: $3862.50

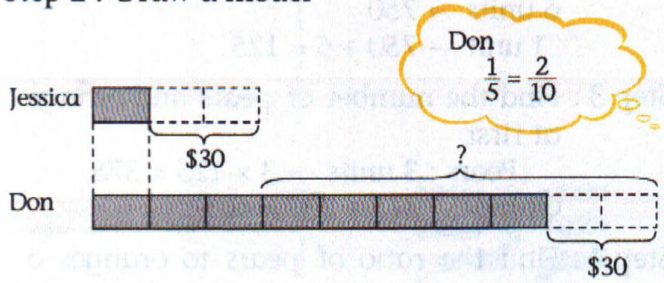
Solution to Question 51

Step 1 : Find the cost of the book and toy

toy $\rightarrow \$18 - \$6 = \$12$

book and toy $\rightarrow \$18 + \$12 = \$30$

Step 2 : Draw a model



Step 3 : Find the difference in the amount of money they had at first

2 units $\rightarrow \$30$

1 unit $\rightarrow \$30 \div 2 = \$15$

7 units $\rightarrow 7 \times \$15 = \$105$

Don had $105 more than Jessica at first.

Answer: $105

Solution to Question 52

Step 1 : Find the amount of money he had in the bank after the first year with interest

$3\% \times \$1500 = \frac{3}{100} \times \$1500 = \$45$

$\$45 + \$1500 = \$1545$

Step 2 : Find the amount of money he had in the bank after the second year with interest

$3\% \times \$1545 = \frac{3}{100} \times \$1545 = \$46.35$

$\$46.35 + \$1545 = \$1591.35$

Step 3 : Find the amount of money he had taken out

$\frac{1}{3} \times \$1591.35 = \$530.45$

Step 4 : Find the amount of money he had left

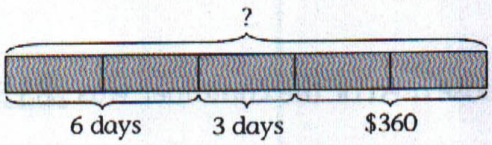
$\$1591.35 - \$530.45 = \$1060.90$

He would have $1060.90 left in the bank.

Answer: $1060.90

Solution to Question 53

Step 1 : Draw a model



Step 2 : Find the amount of money he had at first

2 units $\rightarrow \$360$

1 unit $\rightarrow \$360 \div 2 = \$180$

5 units $\rightarrow 5 \times \$180 = \$900$

He had $900 at first.

Answer: $900

Solution to Question 54

Step 1 : Find the volume of water in the tank

$15 \text{ cm} \times 24 \text{ cm} \times 28 \text{ cm} = 10\,080 \text{ cm}^3$

$\frac{3}{4} \times 10\,080 \text{ cm}^3 = 7560 \text{ cm}^3$

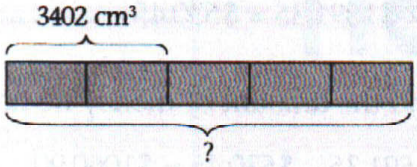
Step 2 : Find the volume of water poured into the empty container

$100\% \rightarrow 7560 \text{ cm}^3$

$1\% \rightarrow 7560 \text{ cm}^3 \div 100 = 75.6 \text{ cm}^3$

$45\% \rightarrow 45 \times 75.6 \text{ cm}^3 = 3402 \text{ cm}^3$

Step 3 : Find the capacity of the container



$2 \text{ units} \rightarrow 3402 \text{ cm}^3$

$1 \text{ unit} \rightarrow 3402 \text{ cm}^3 \div 2 = 1701 \text{ cm}^3$

$5 \text{ units} \rightarrow 5 \times 1701 \text{ cm}^3 = 8505 \text{ cm}^3$

Step 4 : Find the base area of the container

$\text{Volume} = \text{Base area} \times \text{Height}$

$8505 \text{ cm}^3 = \text{Base area} \times 30 \text{ cm}$

$\text{Base area} = 8505 \text{ cm}^3 \div 30 \text{ cm}$

$= 283.5 \text{ cm}^2$

The base area of the container was 283.5 cm^2.

Answer: 283.5 cm^2

Solution to Question 55

Step 1 : Find the area of GDH

$\$10 \rightarrow 1 \text{ m}^2$

$\$125 \rightarrow \$125 \div \$10 = 12.5 \text{ m}^2$

Step 2 : Find the area of the unshaded area

AEH : JCF : GDH

6 : 7 : 5

$5 \text{ units} \rightarrow 12.5 \text{ m}^2$

$1 \text{ unit} \rightarrow 12.5 \text{ m}^2 \div 5 = 2.5 \text{ m}^2$

$(6 + 7 + 5) \text{ units} = 18 \text{ units}$

$18 \text{ units} \rightarrow 18 \times 2.5 \text{ m}^2 = 45 \text{ m}^2$

Step 3 : Find the area of the room

$24 \text{ m} \times 13 \text{ m} = 312 \text{ m}^2$

Step 4 : Find how much it cost to paint the shaded area

$312 \text{ m}^2 - 45 \text{ m}^2 = 267 \text{ m}^2$

$1 \text{ m}^2 \rightarrow \$10$

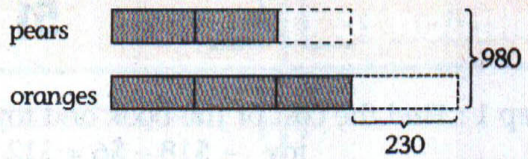
$267 \text{ m}^2 \rightarrow 267 \text{ m}^2 \times \$10 = \$2670$

It will cost $2670 to paint the shaded area.

Answer: $2670

Solution to Question 56

Step 1 : Draw a model



Step 2 : Find the value of 1 unit

$980 - 230 = 750$

$6 \text{ units} \rightarrow 750$

$1 \text{ unit} \rightarrow 750 \div 6 = 125$

Step 3 : Find the number of pears and oranges at first

Pears : $3 \text{ units} \rightarrow 3 \times 125 = 375$

Oranges : $375 + 230 = 605$

Step 4 : Find the ratio of pears to oranges at first

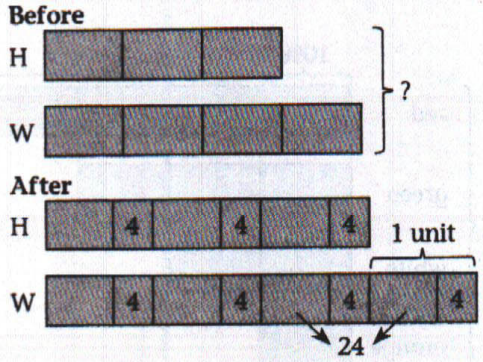
pears	:	oranges
375	:	605
75	:	121

The ratio of pears to oranges was 75 : 121 at first.

Answer: 75 : 121

Solution to Question 57

Step 1 : Draw a model



William lost 24 cards.

Step 2 : Find the number of cards at first

24 + 8 = 32
2 units → 32
1 unit → 32 ÷ 2 = 16
7 units → 7 × 16 = 112

They had 112 cards at first.

Answer: 112 cards

Solution to Question 58

Step 1 : Find the ratio before and after the rotten apples were thrown away

apples : oranges

2 : 3
×4 → 1 : 4 ×4
×3 → 8 : 12 ×3
3 : 12

make the units of oranges to be the same number

8 – 3 = 5 units

Therefore 5 units of rotten apples were thrown away.

Step 2 : Find the total number of units at first

8 + 12 = 20 units

Step 3 : Find the number of rotten apples

20 units → 2520
1 unit → 2520 ÷ 20 = 126
5 units → 5 × 126 = 630

He threw away 630 rotten apples.

Answer: 630 rotten apples

Solution to Question 59

Step 1 : Find the number of sweets Jake, Mandy and Ann had respectively

Jake : Mandy : Ann
4 : 3 : 5

4 + 3 + 5 = 12 units
12 units → 360
1 unit → 360 ÷ 12 = 30
Jake: 4 units → 4 × 30 = 120
Mandy: 3 units → 3 × 30 = 90
Ann: 5 units → 5 × 30 = 150

Step 2 : Find the number of sweets Jake gave to Mandy

$\frac{1}{3} \times 120 = 40$

Step 3 : Find the number of sweets Ann gave to Jake

$\frac{40}{100} \times 150 = 60$

Step 4 : Find the number of sweets Jake and Ann had in the end

120 – 40 = 80
80 + 60 = 140
Jack → 140 sweets

150 – 60 = 90
Ann → 90 sweets

Step 5 : Find the ratio of sweets Jake and Ann had in the end

Jake : Ann
140 : 90
14 : 9

The ratio of Jake's sweets to Ann's sweets was 14 : 9 in the end.

Answer: 14 : 9

Solution to Question 60

Step 1 : Find the length and breadth of the small rectangle

Breadth: 19 m – 2 m – 2 m = 15 m

Length: 26 m – 4 m – 4 m = 18 m

Step 2 : Find the height and base of each triangle

PQ : BC
5 : 3

Height: AB → 5 units – 3 units = 2 units

5 units → 15 m

1 unit → 15 m ÷ 5 = 3 m

2 units → 2 × 3 m = 6 m

Base: 18 m ÷ 3 = 6 m

Step 3 : Find the area of 3 triangles

Area of triangle $= \frac{1}{2} \times$ Base × Height

$= \frac{1}{2} \times 6\text{ m} \times 6\text{ m}$

$= 18\text{ m}^2$

Area of 3 triangles $= 3 \times 18\text{ m}^2$

$= 54\text{ m}^2$

Step 4 : Find the area of the small rectangle

Area of small rectangle = Length × Breadth

$= 15\text{ m} \times 18\text{ m}$

$= 270\text{ m}^2$

Step 5 : Find the area of shaded portion

Area of shaded portion $= 270\text{ m}^2 - 54\text{ m}^2$

$= 216\text{ m}^2$

Step 6 : Find the ratio of the area of the shaded portion to the area of the small rectangle

Area of shaded portion : Area of small rectangle

216 : 270

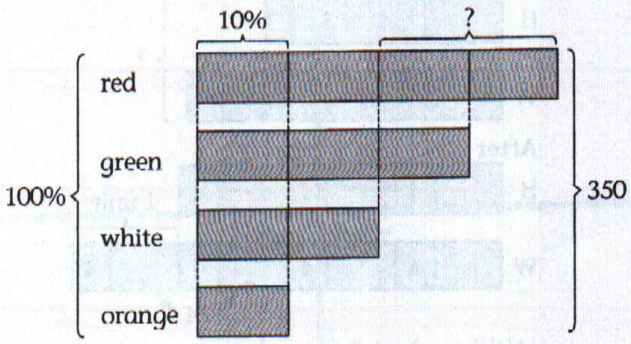
4 : 5

The ratio of the area of the shaded portion to the area of the small rectangle is 4 : 5.

Answer: 4 : 5

Solution to Question 61

Step 1 : Draw a model



Step 2 : Find how many more red marbles there were than white marbles

Red → 40%

White → 20%

40% – 20% = 20% more

100% → 350

1% → 350 ÷ 100 = 3.5

20% → 3.5 × 20 = 70

There were 70 more red marbles than white marbles.

Answer: 70 more red marbles

Solution to Question 62

Step 1 : Find the amount of 1% of flour

20% + 25% → 72 kg

45% → 72 kg

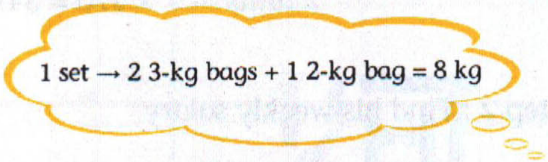
1% → 72 kg ÷ 45 = 1.6 kg

Step 2 : Find the remaining amount of flour

100% – 45% = 55%

55% → 55 × 1.6 kg = 88 kg

Step 3 : Find how many 3-kg and 2-kg bags there were



88 kg ÷ 8 kg = 11 sets

11 sets of 8 kg

= 11 3-kg bags + 11 3-kg bags + 11 2-kg bags

= 22 3-kg bags + 11 2-kg bags

There were 22 bags of 3-kg flour and 11 bags of 2-kg flour.

Answer: 22 bags of 3-kg flour and 11 bags of 2-kg flour

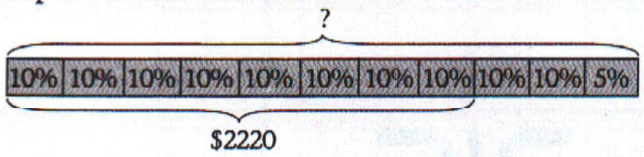
Solution to Question 63

Step 1 : Find the cost of the television set during the sale

16 × $120 = $1920

$1920 + $300 = $2220

Step 2 : Draw a model



Step 3 : Find the cost of the television set after the sale

80% → $2220

1% → $2220 ÷ 80 = $27.75

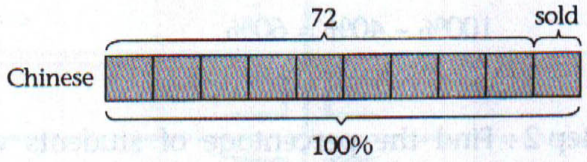
105% → 105 × $27.75 = $2913.75

The television set was $2913.75 after the sale.

Answer: $2913.75

Solution to Question 64

Step 1 : Draw a model and find the number of Chinese books



9 units → 72

1 unit → 72 ÷ 9 = 8

10 units → 10 × 8 = 80

Step 2 : Find the number of Malay books

Chinese books	:	Malay books
4	:	3

4 parts → 80

1 part → 80 ÷ 4 = 20

3 parts → 3 × 20 = 60

Step 3 : Find the number of English books

100% – 20% = 80%

Chinese + Malay books = 80 + 60 = 140

80% → 140

1% → 140 ÷ 80 = 1.75

20% → 20 × 1.75 = 35

There were 35 English books, 80 Chinese books and 60 Malay books in the box at first.

Answers: English: 35

Chinese: 80

Malay: 60

Solution to Question 65

Step 1 : Find the remaining percentage of the students in a class

$100\% - 40\% = 60\%$

Step 2 : Find the percentage of students who joined the Dance Society

$\frac{20}{100} \times 60\% = 12\%$

Step 3 : Find the percentage of students who joined the choir

$60\% - 12\% = 48\%$

Step 4 : Find the total number of students

$48\% - 12\% \rightarrow 108$

$36\% \rightarrow 108$

$1\% \rightarrow 108 \div 36 = 3$

$100\% \rightarrow 100 \times 3 = 300$

Step 5 : Find how many fewer students joined the Art Club than the choir

$48\% - 40\% = 8\%$

$8\% \times 300 = \frac{8}{100} \times 300 = 24$

24 fewer students joined the Art Club than the choir.

Answer: 24 fewer students

Solution to Question 66

Step 1 : Find the amount of the remaining money

savings : money to his mother

5 : 2

5 units – 2 units = 3 units

3 units → \$210

1 unit → \$210 ÷ 3 = \$70

7 units → 7 × \$70 = \$490

Step 2 : Find his weekly salary

$100\% - 20\% = 80\%$

$80\% \rightarrow \$490$

$1\% \rightarrow \$490 \div 80$

$= \$6.125$

$100\% \rightarrow 100 \times \$6.125$

$= \$612.50$

Step 3 : Find the amount of money he spent on food each week

$100\% \rightarrow \$612.50$

$1\% \rightarrow \$612.50 \div 100 = \$6.125$

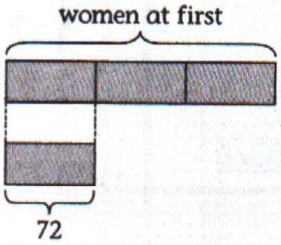
$20\% \rightarrow 20 \times \$6.125 = \$122.50$

He spent \$122.50 on food each week.

Answer: \$122.50

Solution to Question 67

Step 1 : Find the total number of women at first and after 72 women entered the swimming complex



1 unit → 72
3 units → 72 × 3 = 216 (at first)
216 + 72 = 288 (after 72 women entered)

Step 2 : Find the the number of men at first
60% → 216
1% → 216 ÷ 60 = 3.6
100% → 100 × 3.6 = 360
360 – 216 = 144

There were 144 men at first.

Answer: 144 men

Solution to Question 68

Step 1 : Find ∠y

∠DAC = ∠ACB (alternate angles)
= 44°
∠y = (180° – 44°) ÷ 2
= 136° ÷ 2
= 68°

Step 2 : Find ∠x

∠DCA = 68° (isosceles triangle)
∠x = 68° (alternate angles in a parallelogram)

Step 3 : Find ∠z

∠EDC = 37° + 32°
= 69°

∠EFD = 32° (alternate angles in a trapezium)

∠z = 180° – 37° – 32°
= 180° – 69°
= 111° (sum of all ∠s in a triangle)

Answers: ∠x = 68°
∠y = 68°
∠z = 111°

Solution to Question 69

Step 1 : Find ∠ABE

∠ABE = 180° – 90° – 50°
= 40° (sum of all ∠s in a triangle)

Step 2 : Find ∠PBC

∠PBC = 90° – 40° – 42°
= 8°

Step 3 : Find ∠PBQ

∠PBQ = 8° + 54°
= 62°

Step 4 : Find ∠BPQ

∠BPQ = (180° – 62°) ÷ 2
= 118° ÷ 2
= 59° (isosceles triangle)

Answer: 59°

Solution to Question 70

Step 1 : Find the percentage of muffins sold and given to her children

100% – 15% – 20% – 10% = 55%

Step 2 : Find the total number of muffins Mrs Cox made

$1 - \frac{3}{5} = \frac{2}{5}$

$\frac{2}{5} \times 55\% = 22\%$

22% of the muffins were given to her children.
22% → 66 muffins
1% → 66 ÷ 22 = 3 muffins
100% → 100 × 3 = 300 muffins

(a) Mrs Cox made 300 muffins.

Step 3 : Find the amount of money she collected

$\frac{3}{5} \times 55\% = 33\%$

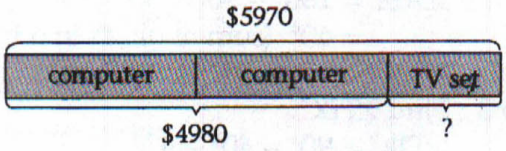
33% → 33 × 3 = 99 muffins
99 × $1.40 = $138.60

(b) Mrs Cox collected $138.60.

Answers: (a) 300 muffins
(b) $138.60

Solution to Question 71

Step 1 : Draw a model



Step 2 : Find the price of the television set during the sale

$5970 – $4980 = $990

Step 3 : Find the original price of the television set

80% → $990

1% → $990 ÷ 80 = $12.375

100% → 100 × $12.375 = $1237.50

(a) The original price of the television set was $1237.50.

Step 4 : Find the price of a computer during the sale

$4980 ÷ 2 = $2490

Step 5 : Find the original price of a computer

60% → $2490

1% → $2490 ÷ 60 = $41.50

100% → 100 × $41.50 = $4150

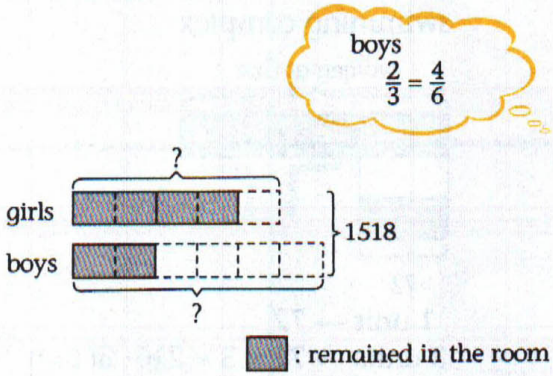
(b) The original price of a computer was $4150.

Answers: (a) $1237.50

(b) $4150

Solution to Question 72

Step 1 : Draw a model



Step 2 : Find the number of girls at first

11 units → 1518

1 unit → 1518 ÷ 11 = 138

5 units → 5 × 138 = 690

(a) There were 690 girls at first.

Step 3 : Find the number of boys at first

6 units → 6 × 138 = 828

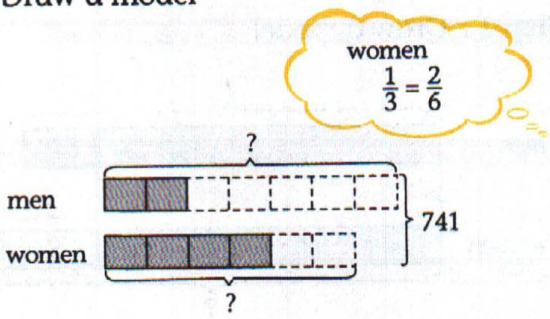
(b) There were 828 boys at first.

Answers: (a) 690 girls

(b) 828 boys

Solution to Question 73

Step 1 : Draw a model



Step 2 : Find the number of women in the room at first

13 units → 741

1 unit → 741 ÷ 13 = 57

6 units → 6 × 57 = 342

(a) There were 342 women in the room at first.

Step 3 : Find the number of men in the room at first

7 units → 7 × 57 = 399

(b) There were 399 men in the room at first.

Answers: (a) 342 women

(b) 399 men

Solution to Question 74

Step 1 : Find the total mark scored by Joel, Zack, Alvin, Linda and Adeline

5 × 87 = 435

Step 2 : Find the total mark scored by Joel, Zack and Alvin

3 × 85 = 255

Step 3 : Find the total mark scored by Linda and Adeline

435 − 255 = 180

Step 4 : Find the total mark scored by Linda, Adeline and Zack

3 × 88 = 264

Step 5 : Find the mark scored by Zack

264 − 180 = 84

(a) Zack scored 84 marks.

Step 6 : Find the total mark scored by Joel and Alvin

255 − 84 = 171

(b) The total mark scored by Joel and Alvin was 171.

Answer: (a) 84 marks

(b) 171 marks

Solution to Question 75

Step 1 : Find the number of units Tom used in January

4090 units − 1045 units = 3045 units

Step 2 : Find the amount of money he had to pay at the end of January

1000 units → $2.20

2000 units → $2.20 + $2.50

3000 units → $2.20 + $2.50 + $2.80

3045 units → $2.20 + $2.50 + $2.80 + $3.00

= $10.50

(a) He had to pay $10.50 at the end of January.

Step 3 : Find the units shown on the household meter at the end of February

$7.50 = $2.20 + $2.50 + $2.80

= 1000 units + 1000 units + 1000 units

= 3000 units

4090 units + 3000 units = 7090 units

(b) The maximum number of units that could be shown on the household meter at the end of February was 7090 units.

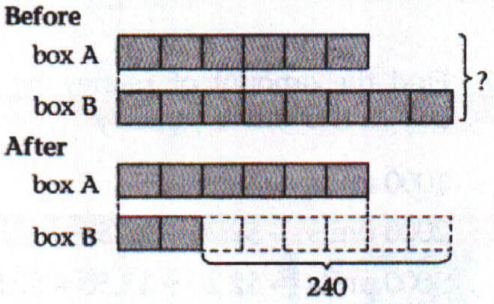
Answers: (a) $10.50

(b) 7090 units

Solution to Question 76

Step 1 : Draw a model

$\frac{1}{2} = \frac{3}{6}$



Step 2 : Find the total number of sweets in the boxes at first

6 units → 240

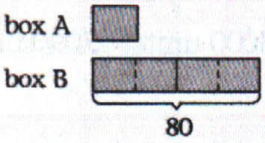
1 unit → 240 ÷ 6 = 40

14 units → 14 × 40 = 560

(a) The total number of sweets in the boxes at first was 560.

Step 3 : Draw another model

Box B: 2 units → 2 × 40 = 80



Step 4 : Find the number of sweets to be left in box A in the end

$\frac{1}{4} \times 80 = 20$

Step 5 : Find the number of sweets that would have to be taken out from box A

Box A: 6 units → 240

240 – 20 = 220

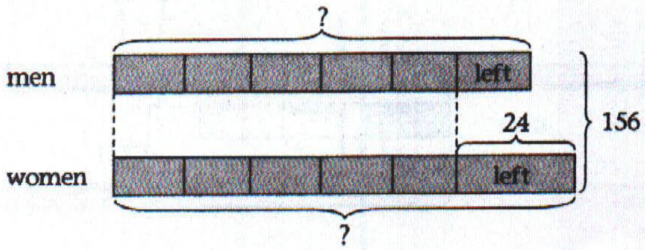
(b) 220 sweets would have to be taken out from box A so that there would be $\frac{1}{4}$ as many sweets in box A as in box B.

Answers: (a) 560 sweets

(b) 220 sweets

Solution to Question 77

Step 1 : Draw a model



Step 2 : Find the number of men who left the party

11 units → 156 – 24 = 132

1 unit → 132 ÷ 11 = 12

Step 3 : Find the number of men at the party

6 units → 6 × 12 = 72

(a) 72 men were at the party at first.

Step 4 : Find the number of women at the party

5 units → 5 × 12 = 60

60 + 24 = 84

(b) 84 women were at the party at first.

Answers: (a) 72 men

(b) 84 women

Solution to Question 78

Step 1 : Find the total number of biscuits machine A can produce in a week

$7 \times 7500 = 52\,500$

Step 2 : Find the total number of biscuits machine B can produce in a week

$7500 + 240 = 7740$

$7 \times 7740 = 54\,180$

Step 3 : Find the number of packs of biscuits after a week

$52\,500 + 54\,180 = 106\,680$

$106\,680 \div 20 = 5334$

(a) There will be 5334 packs of biscuits after a week.

Step 4 : Find the number of complete boxes of biscuits after a week

$5334 \div 1000 = 5.334$

≈ 5 boxes

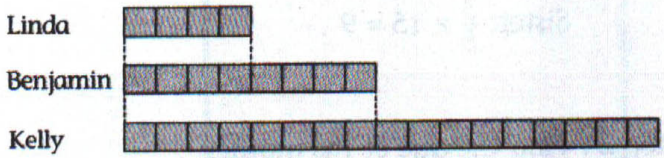
(b) There will be 5 complete boxes of biscuits after a week.

Answers: (a) 5334 packs of biscuits

(b) 5 complete boxes of biscuits

Solution to Question 79

Step 1 : Draw a model



Step 2 : Find the amount of money each of them paid for their greeting cards

Benjamin : $8 \times \$13 = \$104$

Linda : $4 \times \$15.50 = \$62$

Kelly : $17 \times \$12 = \$204$

(a) Benjamin paid \$104, Linda paid \$62 and Kelly paid \$204 for their greeting cards.

Step 3 : Find the total amount of money they paid altogether

$\$62 + \$104 + \$204 = \$370$

Step 4 : Find the amount of money they could save if they bought the greeting cards together

$4 \text{ sets} + 8 \text{ sets} + 17 \text{ sets} = 29 \text{ sets}$

$29 \times \$8 = \$232$

$\$370 - \$232 = \$138$

(b) They could save \$138 if they bought the greeting cards together.

Answers: (a) Benjamin: \$104

Linda: \$62

Kelly: \$204

(b) \$138

Solution to Question 80

Step 1 : Find the age of his sister

Sister: $\frac{3}{5} \times 15 = 9$

Step 2 : Find the age of his mother

sister	:	mother
3	:	14

3 units → 9

1 unit → 9 ÷ 3 = 3

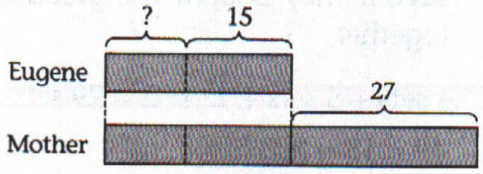
14 units → 14 × 3 = 42

Step 3 : Find how much older is Eugene's mother than him

42 – 15 = 27

(a) Eugene's mother is 27 years older than him.

Step 4 : Draw a model and find the number of years needed for his mother to be twice the age of Eugene



27 – 15 = 12

(a) Eugene's mother will be twice his age in 12 years' time.

Answers: (a) 27 years older

(b) 12 years' time

Solution to Question 81

Step 1 : Find the number of minutes equivalent to $\frac{3}{4}$ hour

$\frac{3}{4} \times 60$ minutes = 45 minutes

Step 2 : Find the number of tarts that machines A and B could make in $\frac{3}{4}$ hour

Machine A: 120 × 45 minutes = 5400

Machine B: 90 × 45 minutes = 4050

Step 3 : Find the length of time machine A was stopped

5400 – 4050 = 1350

1350 ÷ 90 = 15 minutes

(a) Machine A was stopped for 15 minutes.

Step 4 : Find how many more tarts machine A could make if it was not stopped

1 minute → 120

15 minutes → 15 × 120 = 1800

(b) Machine A could produce 1800 more tarts if it was not stopped.

Answers: (a) 15 minutes

(b) 1800 tarts

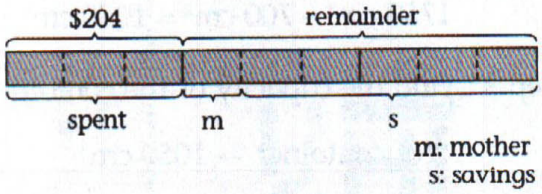
Solution to Question 82

Step 1 : Find the amount of money Lydia spent

$\$74 + \$74 + \$56 = \$204$

Step 2 : Draw a model

$\frac{2}{3} = \frac{6}{9}$



Step 3 : Find how much more she saved than spent

3 units → $204

1 unit → $204 ÷ 3 = $68

2 units → 2 × $68 = $136

(a) Lydia saved $136 more than what she had spent.

Step 4 : Find the fraction of money she would have saved

$136 → 2 units

5 units + 2 units = 7 units

$$\frac{\text{Total Amount of money saved}}{\text{Total amount of money}} = \frac{7}{9}$$

(b) She would have saved $\frac{7}{9}$ of her money.

Answers: (a) $136

(b) $\frac{7}{9}$

Solution to Question 83

Step 1 : Find the total amount of money Samuel's daughters received

Beatrice : Felicia : Joyce

1 : 3 : 2

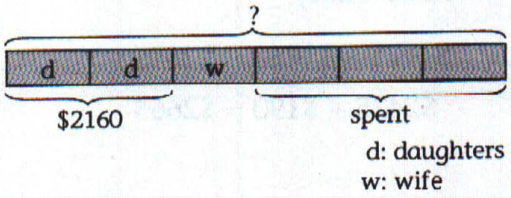
3 units → $1080

1 unit → $1080 ÷ 3 = $360

6 units → 6 × $360 = $2160

Step 2 : Draw a model

$\frac{1}{2} = \frac{3}{6}$



Step 3 : Find Samuel's salary

2 units → $2160

1 unit → $2160 ÷ 2 = $1080

6 units → 6 × $1080 = $6480

(a) Samuel's salary was $6480.

Step 4 : Find how many percent more Samuel spent than amount given to his wife

$$\frac{\text{Difference in amount of money he spent and given to his wife}}{\text{Total amount of money}} \times 100\%$$

$$= \frac{\$2160}{\$6480} \times 100\%$$

$$= \frac{100}{3}\% = 33\frac{1}{3}\%$$

(b) Samuel spent $33\frac{1}{3}\%$ more than what he gave his wife.

Answers: (a) $6480

(b) $33\frac{1}{3}\%$

Solution to Question 84

Step 1 : Find Tom's salary in January

40% → \$1650

1% → \$1650 ÷ 40 = \$41.25

100% → 100 × \$41.25 = \$4125

Step 2 : Find Tom's salary in February

20% → 20 × \$41.25 = \$825

\$4125 + \$825 = \$4950

Step 3 : Find the amount of money Tom saved in February

\$4125 – \$1650 = \$2475

\$2475 + \$190 = \$2665

(a) He saved \$2665 in February.

Step 4 : Find the amount of money Tom spent in February

\$4950 – \$2665 = \$2285

(b) He spent \$2285 in February.

Answers: (a) \$2665

(b) \$2285

Solution to Question 85

Step 1 : Find the capacity of the basin

$\frac{1}{5}$ filled → 700 cm^3

$\frac{5}{5}$ filled → 5 × 700 cm^3 = 3500 cm^3

Step 2 : Find the volume of water poured from the container

3500 cm^3 ÷ 2 = 1750 cm^3

1750 cm^3 – 700 cm^3 = 1050 cm^3

Step 3 : Find the capacity of the container

$\frac{2}{3}$ of container → 1050 cm^3

$\frac{1}{3}$ of container → 1050 cm^3 ÷ 2

= 525 cm^3

$\frac{3}{3}$ of container → 3 × 525 cm^3

= 1575 cm^3

Step 4 : Find the original water level in the tank

tank → 2 × 1575 cm^3 = 3150 cm^3

Volume = Base area × Height

3150 cm^3 = 10 cm × 10 cm × Height

Height = 3150 cm^3 ÷ 100 cm^2

= 31.5 cm

(a) The original water level in the tank was 31.5 cm.

Step 5 : Find the height of the tank

$\frac{3}{4}$ of tank → 31.5 cm

$\frac{1}{4}$ of tank → 31.5 cm ÷ 3

= 10.5 cm

$\frac{4}{4}$ of tank → 4 × 10.5 cm

= 42 cm

(b) The height of the tank was 42 cm.

Answers: (a) 31.5 cm

(b) 42 cm

Solution to Question 86

Step 1 : Draw a model

Step 2 : Find the cost of each T-shirt

16 T-shirts – 7 T-shirts → $19 + $8

9 T-shirts → $27

1 T-shirt → $27 ÷ 9

= $3

Step 3 : Find the cost of 2 such T-shirts

2 T-shirts → 2 × $3 = $6

(a) The cost of 2 such T-shirts was $6.

Step 4 : Find the amount of money Cleo had

7 × $3 = $21

$21 + $19 = $40

(b) Cleo had $40.

Answers: (a) $6

(b) $40

Solution to Question 87

Step 1 : Find the amount of money Cindy gave to her brother

watch : books

5 : 2

Cost of 3 similar books → 3 × $8

= $24

2 parts → $24

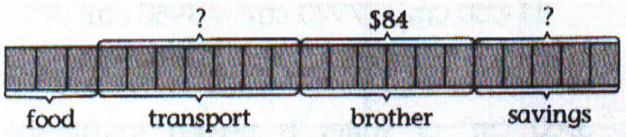
1 part → $24 ÷ 2 = $12

7 parts → 7 × $12 = $84

Step 2 : Draw a model

$\frac{1}{7} = \frac{3}{21}$,

$\frac{1}{3} = \frac{7}{21}$



Step 3 : Find the amount of money Cindy spent on transport

6 units → $84

1 unit → $84 ÷ 6 = $14

7 units → 7 × $14 = $98

(a) Cindy spent $98 on transport.

Step 4 : Find the amount of money Cindy saved

5 units → 5 × $14 = $70

(b) Candy saved $70.

Answers: (a) $98

(b) $70

Solution to Question 88

Step 1 : Find the volume of water in the container at first

$18 \text{ cm} \times 22 \text{ cm} \times 30 \text{ cm} = 11\,880 \text{ cm}^3$

$\frac{1}{2} \times 11\,880 = 5940 \text{ cm}^3$

Step 2 : Find the volume of water in the container after some water is poured into it

$\frac{1}{3} \times 5940 \text{ cm}^3 = 1980 \text{ cm}^3$

$1980 \text{ cm}^3 + 5940 \text{ cm}^3 = 7920 \text{ cm}^3$

Step 3 : Find the volume of water needed to fill the container

$11\,880 \text{ cm}^3 - 7920 \text{ cm}^3 = 3960 \text{ cm}^3$

(a) 3960 cm^3 of water is needed to fill the container.

Step 4 : Find the time needed to fill up the container

$3960 \text{ cm}^3 \div 660 \text{ cm}^3/\text{minute} = 6 \text{ minutes}$

(b) It will take 6 minutes to fill up the container.

Answers: (a) 3960 cm^3

(b) 6 minutes

Solution to Question 89

Step 1 : Find the amount of money given to her son

spent : saved

3 : 7

3 parts → \$24

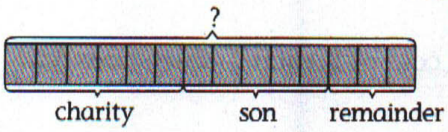
1 part → \$24 ÷ 3 = \$8

3 parts + 7 parts = 10 parts

10 parts → 10 × \$8 = \$80

Step 2 : Draw a model and find the remaining amount of money after Agnes gave to charity and her son

$\frac{3}{7} = \frac{6}{14}$



5 units → \$80

1 unit → \$80 ÷ 5 = \$16

3 units → 3 × \$16 = \$48

Step 3 : Find the amount of money Agnes had left in the end

\$48 – \$20 – \$17 = \$11

(a) Agnes had \$11 left in the end.

Step 4 : Find the amount of money she had at first

14 units → 14 × \$16 = \$224

(b) Agnes had \$224 at first.

Answers: (a) \$11

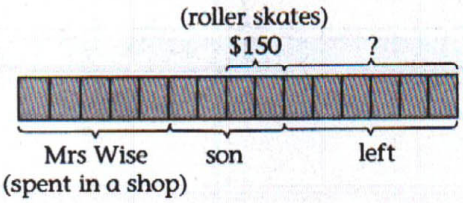
(b) \$224

Solution to Question 90

Step 1 : Draw a model

$\frac{1}{3} = \frac{5}{15}$

$\frac{2}{5} = \frac{4}{10}$



Step 2 : Find the amount of money Mrs Wise had left

2 units → $150

1 unit → $150 ÷ 2 = $75

6 units → 6 × $75 = $450

(a) Mrs Wise had $450 left.

Step 3 : Find the amount of money she spent on the necklace

5 units → 5 × $75 = $375

$375 – $180 = $195

(b) Mrs Wise spent $195 on the necklace.

Answers: (a) $450

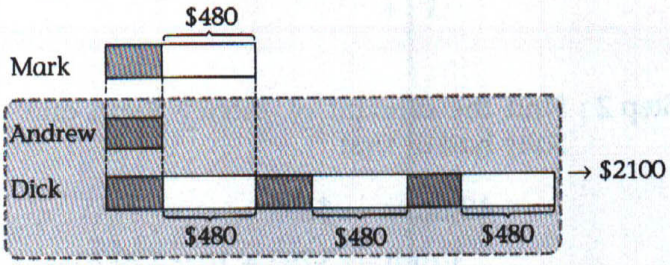
(b) $195

Solution to Question 91

Step 1 : Find the total amount of money that Dick and Andrew had at first

$1500 + $600 = $2100

Step 2 : Draw a model



Step 3 : Find the amount of money Andrew had at first

3 × $480 = $1440

$2100 – $1440 = $660

4 units → $660

Andrew: 1 unit → $660 ÷ 4 = $165

Step 4 : Find the amount of money Mark and Dick had at first

Mark: $165 + $480 = $645

Dick: 3 × $645 = $1935

(a) Andrew had $165, Mark had $645 and Dick had $1935 at first.

Step 5 : Find the total amount of money the boys had

$165 + $645 + $1935 = $2745

(b) The boys had $2745 altogether.

Answers: (a) Andrew: $165

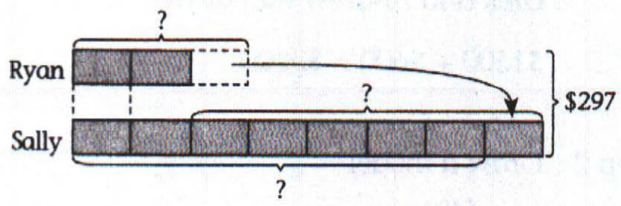
Mark: $645

Dick: $1935

(b) $2745

Solution to Question 92

Step 1 : Draw a model



Step 2 : Find the amount of money Ryan and Sally had at first

10 units → $297

1 unit → $297 ÷ 10 = $29.70

Ryan: 3 units → 3 × $29.70 = $89.10

Sally: 7 units → 7 × $29.70 = $207.90

(a) Ryan had $89.10 and Sally had $207.90 at first.

Step 3 : Find how much more money Sally had than Ryan in the end

6 units → 6 × $29.70 = $178.20

(b) Sally had $178.20 more than Ryan in the end.

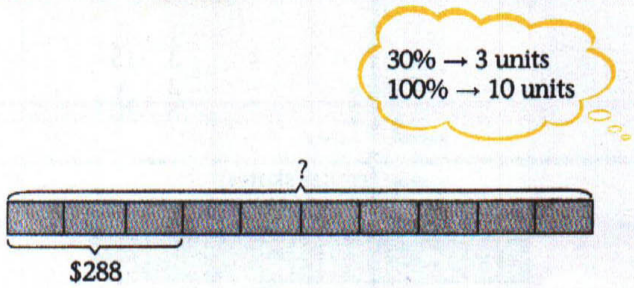
Answers: (a) Ryan: $89.10

Sally: $207.90

(b) $178.20

Solution to Question 93

Step 1 : Draw a model



Step 2 : Find the amount of money she had altogether

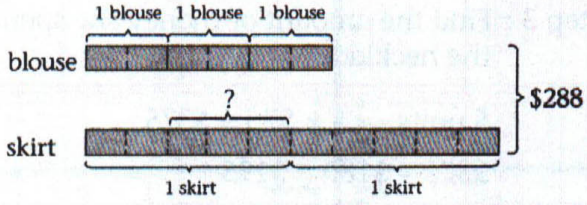
3 units → $288

1 unit → $288 ÷ 3 = $96

10 units → 10 × $96 = $960

(a) She had $960 at first.

Step 3 : Draw another model



Step 4 : Find how much more a skirt cost than a blouse

16 units → $288

1 unit → $288 ÷ 16 = $18

3 units → 3 × $18 = $54

(b) A skirt cost $54 more than a blouse.

Answers: (a) $960

(b) $54

Solution to Question 94

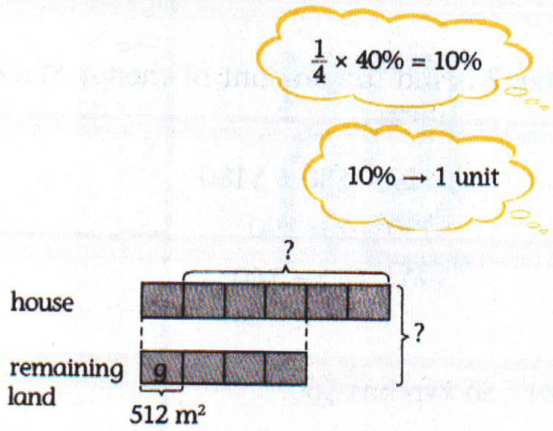
Step 1 : Find the area of garden

2 breadths → 96 m – 32 m – 32 m = 32 m

Breadth → 32 m ÷ 2 = 16 m

Area of the garden = Length × Breadth
= 32 m × 16 m
= 512 m²

Step 2 : Draw a model



g: garden

Step 3 : Find the area of the original piece of land

10 units → 10 × 512 m² = 5120 m²

(a) The area of the original piece of land was 5120 m².

Step 4 : Find how much bigger was the area used to build the house than the garden

5 units → 5 × 512 m² = 2560 m²

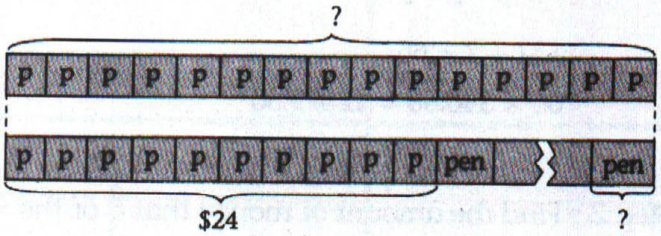
(b) The area used to build the house was 2560 m² bigger than the garden.

Answers: (a) 5120 m²

(b) 2560 m²

Solution to Question 95

Step 1 : Draw a model



p: pencil

Step 2 : Find the amount of money Joanne has

$1 = 100¢

2400¢ ÷ 10 = 240¢

15 × 240¢ = 3600¢
= $36

Step 3 : Find the cost of a pen

$36 ÷ 9 = $4

(a) A pen costs $4.

Step 4 : Find the number of pens she buys

$36 – $24 = $12

$12 ÷ $4 = 3

(b) She buys 3 pens.

Answers: (a) $4

(b) 3 pens

Solution to Question 96

Step 1 : Find the amount of money that half of the people paid

$132 \div 2 = 66$

$66 \times \$40.60 = \$2679.60$

Step 2 : Find the amount of money that $\frac{2}{3}$ of the remaining people paid

$\frac{2}{3} \times 66 = 44$

$44 \times \$50 = \$2200$

Step 3 : Find the amount of money that $\frac{1}{3}$ of the remaining people paid

$\frac{1}{3} \times 66 = 22$

$22 \times \$55.20 = \$1214.40$

Step 4 : Find the total cost of the dinner

$\$2679.60 + \$2200 + \$1214.40 = \$6094$

$\$6094 + \$110 = \$6204$

(a) The total cost of the dinner was $6204.

Step 5 : Find the amount of money each person should paid

$\$6204 \div 132 = \$47$

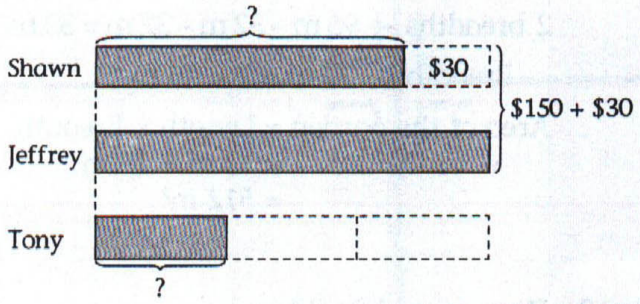
(b) Each person should pay $47.

Answers: (a) $6204

(b) $47

Solution to Question 97

Step 1 : Draw a model



Step 2 : Find the amount of money Shawn has at first

$\$150 + \$30 = \$180$

$\$180 \div 2 = \$90$

$\$90 - \$30 = \$60$

(a) Shawn has $60.

Step 3 : Find the amount of money Tony has at first

3 units → $90

1 unit → $\$90 \div 3$

$= \$30$

(b) Tony has $30.

Answers: (a) $60

(b) $30

Solution to Question 98

Step 1 : Find the total number of words in 8 similar sets of notes

3 hours – 2 hours = 1 hour

1 hour = 60 minutes

60 words × 60 minutes = 3600 words

Step 2 : Find Andrew's original typing speed

3 hours = 180 minutes

3600 ÷ 180 = 20

(a) Andrew's original typing speed was 20 words per minute.

Step 3 : Find the total number of words for 10 sets of notes

8 sets of notes → 3600 words

1 set of notes → 3600 ÷ 8
= 450 words

10 sets of notes → 10 × 450
= 4500 words

Step 4 : Find how fast Andrew had to type per minute

3 hours = 180 minutes
2.5 hours = 120 + 30
= 150 minutes

4500 words ÷ 150 minutes = 30 words/minutes

(b) He would have to type 30 words per minute if he wanted to finish 10 sets of notes in 2.5 hours.

Answers: (a) 20 words per minute

(b) 30 words per minute

Solution to Question 99

Step 1 : Find the height of the tank

$\frac{1}{4}$ full → 9 cm

$\frac{4}{4}$ full → 4 × 9 cm = 36 cm

Step 2 : Find the length and breadth of the tank

length	:	height
7	:	3

3 units → 36 cm

1 unit → 36 cm ÷ 3 = 12 cm

7 units → 7 × 12 cm = 84 cm

Length → 84 cm

Breadth → $\frac{1}{\cancel{4}_1} \times \frac{\cancel{84}^{21}}{1}$ = 21 cm

Step 3 : Find the capacity of the tank

84 cm × 21 cm × 36 cm = 63 504 cm^3

(a) The capacity of the tank was 63 504 cm^3.

Step 4 : Find the time for the tap to fill up the tank

1 litre = 1000 cm

63 504 cm^3 = 63.504 litres

$\frac{63.504}{7}$ = 9.072 minutes ≈ 9 minutes

(b) The tap will take about 9 minutes to fill up the tank completely.

Answers: (a) 63 504 cm^3

(b) 9 minutes

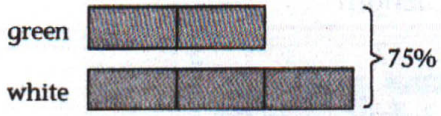
Solution to Question 100

Step 1 : Find the percentage of blue cards

$\frac{1}{4} \times 20\% = 5\%$

Step 2 : Find the percentage of green and white cards

$100\% - 20\% - 5\% = 75\%$



5 units → 75%

1 unit → 75% ÷ 5 = 15%

Green: 2 units → 2 × 15% = 30%

White: 3 units → 3 × 15% = 45%

(a) 30% of the cards in the box are green.

Step 3 : Find the total number of cards

75% → 150 cards

1% → 150 ÷ 75 = 2 cards

100% → 100 × 2 = 200 cards

(b) There are 200 cards altogether.

Answers: (a) 30%

(b) 200 cards

Solution to Question 101

Step 1 : Find the cost of the refrigerator after the discount

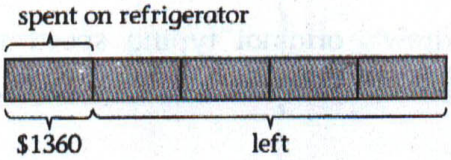
100% → $1700

1% → $1700 ÷ 100 = $17

80% → 80 × $17 = $1360

(a) The refrigerator cost $1360 after the discount.

Step 2 : Draw a model



Step 3 : Find the amount of money Sylvia had left

1 unit → $1360

4 units → 4 × $1360 = $5440

Step 4 : Find the amount spent on television

Television:

30% → $\frac{30}{100} \times \$5440 = \$1632$

(b) She spent $1632 on the television.

Answers: (a) $1360

(b) $1632