

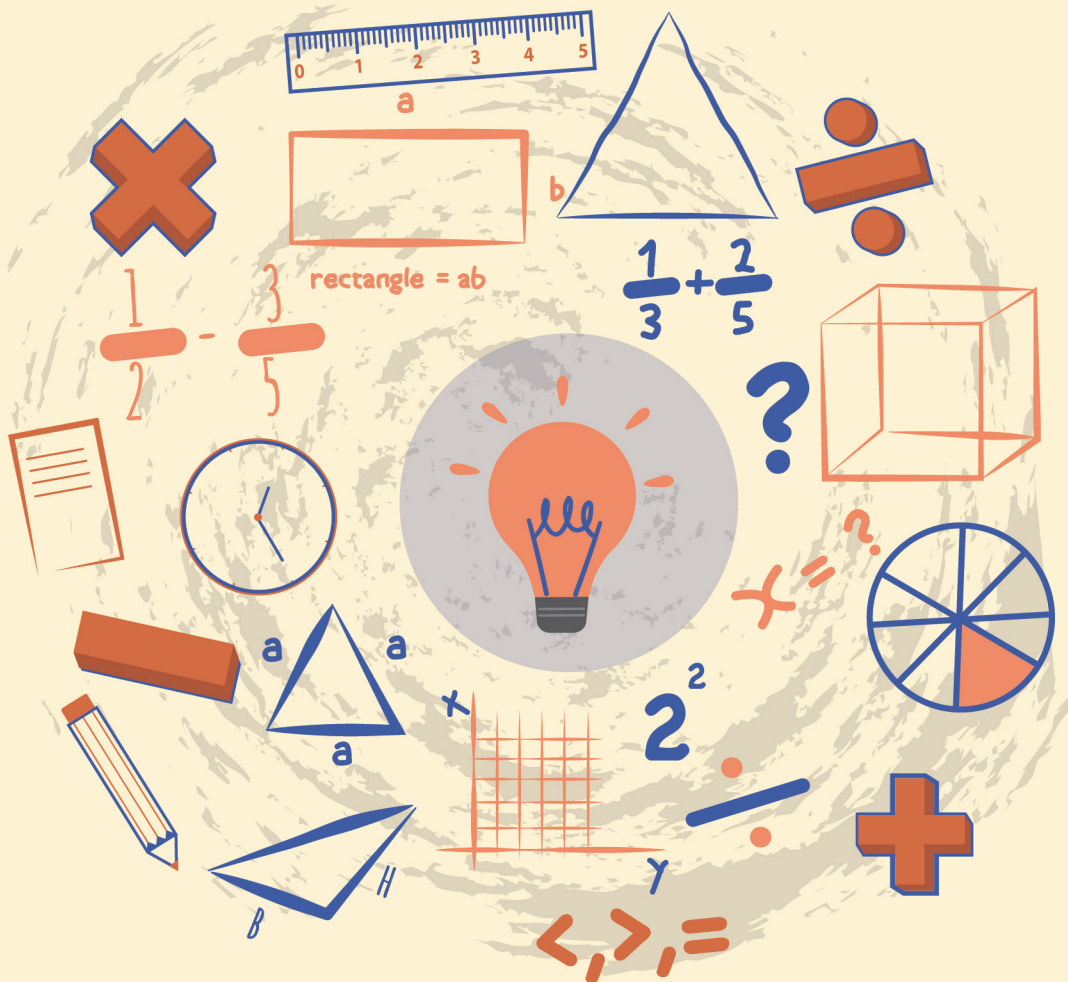


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11+ Maths

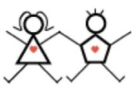
Advanced Algebra

COURSE HANDBOOK



Effective Crash Course

• Practice Questions • Homework • Past Paper Questions



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Homework

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Warm Up

This warmup section forms the prerequisite for the Practise section. Teacher begins the class with warmup. The quick test follows the warmup section and tests the child's prerequisite knowledge. The warm-up exercise takes around 15-20 minutes

Practice

The practice section follows the warm-up section. The tutor uses the practice section while tutoring and solves the problems in this section while teaching the concept. It is advisable for the parents to print a copy of this handbook and keep it ready before the class.

Homework

The homework section is the last section and is helpful for the students to practice the concepts learned in the lesson. The homework includes past paper exam questions. The parents are expected to mark the student's homework.

Answers

Answers are provided for each exercise: Warmup, Practise, Homework. Parents are requested to mark the homework. Mention the final percentage of each homework to the teacher. This will help the teacher to understand the level of the concept of understanding by the student.

The entire handbook covers the keywords and key points which are helpful for a quick revision.

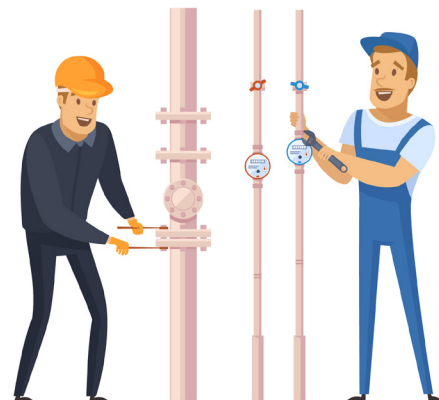


Practice Questions

- 7 Lucas spent £37 for football. This was £11 less than twice what he spent for a cricket bat. How much was the cricket bat?



- 8 Richard and Henry worked as plumbers at £15 and £18 per hour respectively. One month, Richard worked 12 hours more than Henry. If their total income for the month was £4206, how many hours did each work during the month?

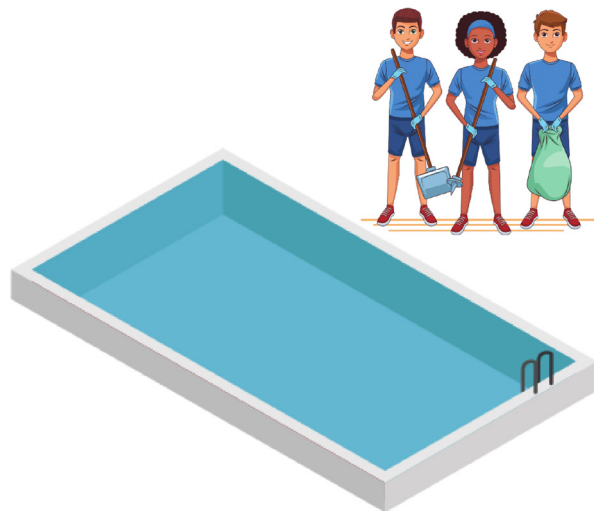




Practice Questions

- 12 A group of 320 persons consists of men, women, and children. There are three times as many men as children, and six times as many women as children. How many of each are there?

- 13 Adam, Beth, and Charles will be paid £94 together for cleaning the pool. Beth will have twice as much as Adam, and Charles will have £6 less than Beth. How much does each person get paid?





Practice Questions

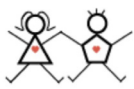
14 Divide £107 among three people so that the third will have five times more than the second, and the first will have eight pounds more than the third.

15 King Peter had 33 gold coins. He put them in four piles.

- The first pile had six more coins than the second.
- The second pile had three less coins than the third.
- The fourth pile had thrice as many coins as the second.

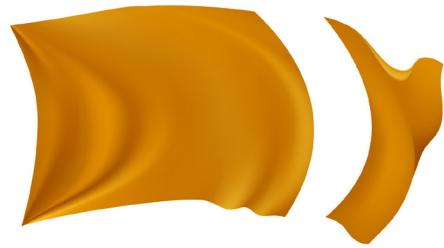
How many gold coins did Peter put in each pile?



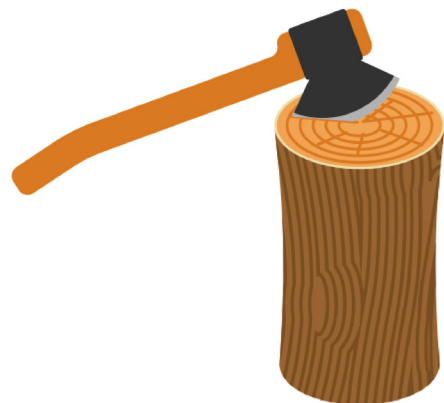


Practice Questions

- 38 A piece of fabric 120 cm long is cut into two pieces such that 3 times the larger piece exceeds 5 times the smaller piece by 24 cm. How large are the two pieces of fabric?



- 39 A log of timber which is 55 cm long is cut into two pieces such that 2 times the larger piece will be 40 more than 5 times the smaller piece. How long are each of the pieces of timber?



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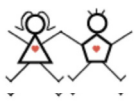
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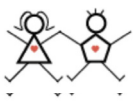
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Keypoints

Word problems	Algebraic Expression
the sum of 3 and a number	$n+3$ or $3+n$
7 more than a number	$n+7$ or $7+n$
a number plus 2	$n+2$ or $2+n$
a number increased by 8	$n+8$ or $8+n$
add 9 to a number	$n+9$ or $9+n$
Jon is 9 years older than mik who is 'n' years old	$n+9$
's' is raised by 120	$s + 120$
a number minus 6	$n - 6$
9 less than a number	$n - 9$
subtract 10 from a number	$n - 10$
a number decreased by 5	$n - 5$
a is twice that of b	$a = 2b$
a is thrice that of b	$a = 3b$
8 times a number increased by 4	$8n + 4$
8 times the sum of a number and 4	$8(n + 4)$



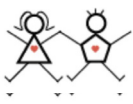
Homework

- 1 The length of a rectangular garden is five cm greater than the width. [2]
The perimeter is 162 cm. What are the dimensions of the rectangular garden?



- 2 The length of a rectangular plot is 3 m more than twice the width. The [2]
perimeter is 222 m. What is the length and the width?

- 3 There are two numbers whose sum is 112. One number is thrice the [2]
other. What are the numbers?



Only mastermind can solve

Ayesha has 5 jars with her.
She wants to fill them with 100 marbles.



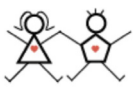
In the first and second there are altogether fifty marbles.

In the second and third there are Fifty-five.

In the third and fourth, forty.

In the fourth and fifth, twenty-five.

How many marbles are there in each jar?



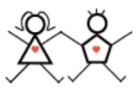
Chapter 2: Answers

18. 39
19. 52, 54, 56
20. 47, 49, 51
21. 39, 40, 41
22. 43, 45, 47
23. 23 cm, 25 cm, 27 cm
24. 10, 11, 12
25. 25, 27, 29
26. i) 3
ii) 16
iii) 8
iv) 19
v) 7
27. Number = 20
28. Number = 2
29. Number = 2
30. Number = 27
31. Number = 50
32. Smaller number = 24
Larger number = 48
33. Smaller number = 42
Larger number = 54
34. Number = 15
35. Smaller number = 5
Larger number = 7
36. Smaller number = 10
Larger number = 26
37. Short desk = 5 m
Long desk = 9 m
38. Larger piece = 78 cm
Smaller piece = 42 cm
39. Larger piece = 45 cm
Smaller piece = 10 cm
40. Bob = 6 candies
Alex = 30 candies

Algebra Variables on both sides:

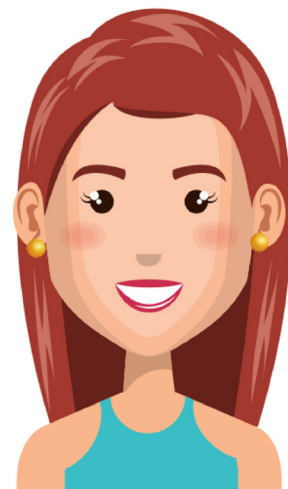
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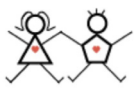
CHAPTER 3



Practice Questions

- 25 My age this year is a multiple of 6. Next year it will be a multiple of 5. My age is less than 50. How old am I?
- 26 Last year Lauren's age was a square number. Next year it will be a cube number.
- a) How old is Lauren?
 - b) How long must she wait until her age is both a square number and a cube?

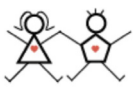




Practice Questions

- 29 Jules age is 4 years more than three times Robert's age, and the sum of their ages is 40 years. How old is each?
- 30 Charles is three times as old as his daughter, and his son is 5 years older than his daughter. If the sum of their ages 2 years ago was 74 years, find the present age of the Charles.



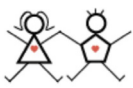


Homework

- 9 Laura went to a fare and spent a fourth of her money on food, a fifth on a blouse, a third on shoes, and she came home with £65. How much did she start out with? [2]

- 10 Stephen spent $\frac{1}{3}$ of his day salary for food and $\frac{1}{4}$ of his day salary for his clothes. If £10 was left, what was his day salary? [2]





Homework - Past paper Questions

3

Jonathon and his dad were both born on 5th August.

Jonathon was born in 1985 and his father is 32 years older than him.

In which year was his dad born?

.....
[1]

Ref: Aldenham School , Q2a, 11+ Past Paper 2019

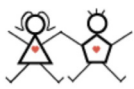
4

A group of 30 adults and 16 children paid £408 in total to watch a football match. Each child ticket cost £3.

What was the cost of each adult ticket?

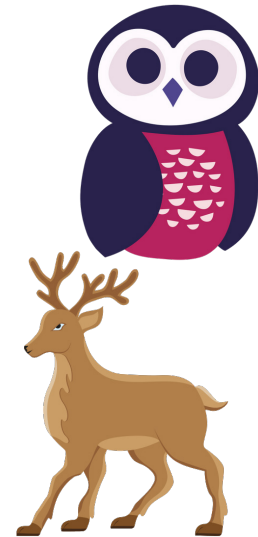
£..... (3 marks)

Ref: Bancroft's School, Q21a, 11+ Past Paper 2018



Practice Questions

- 9 A zookeeper was asked how many deer and owls were in the zoo. The zookeeper answered, “Among the animals there are 84 ears and 108 feet.” How many of each kind of animal were there?



- 10 Jacob counts 36 heads and 94 legs among the ducks and sheep on his farm. How many sheep and how many ducks does he have?

“

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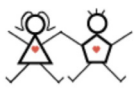
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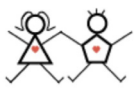
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Practice Questions

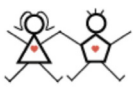
- 30 The tens digit of a two-digit number is twice the units digit. If the digits are reversed. The new number is 36 less than the original number. Find the number
- 31 The sum of the digits in a two-digit number is a new two-digit number. The new number is 9 less than the original number. What is the original number?
- 32 The sum of the digits of a two-digit number is a new number. Twice of the new number is the original number itself. Find the number.



Practice Questions

- 35 David, the detective looked for a number. He found a two-digit number less than 50. The sum of its digits was 12. Their difference was 6. What number did David find?



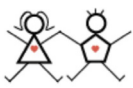


Homework

- 7 800 museum tickets were sold. Adult tickets cost £6.50, kid's cost £3.50, and a total of £4150 was collected. How many tickets of each kind were sold? [2]



- 8 The London City Royals scored a total of 75 points in a basketball game against the Worthing Thunder. The London City Royals made a total of 30 two-point and three-point baskets. How many two-point shots did the London City Royals make? How many three-point shots did the London City Royals make? [2]



Homework - Past paper Questions

- 7 In a barn there are only horses and people. If there are 12 heads and 34 legs how many horses and how many people are there?
- Horses.....[1 mark]
- People.....[1 mark]

Ref: Merchant Taylors' School, Q28, 11+ Past Paper 2009

- 8 Raaj bought a banana and three apples for 44p and Violet bought a banana and ten apples for £1.07. Calculate the individual cost of one banana and one apple in pounds.

Apple = £

Banana = £

[2 Marks]

Ref: Independent Mock Style, Q11, 11+ Past Paper 2020

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CHAPTER 5

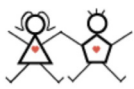


Practice Questions

Two objects traveling in the opposite directions:

- 15 Two bikes leave from the same place at the same time and travel in opposite directions. One bike travel at 45 mph and the other at 65 mph. After how many hours will they be 550 miles apart?
- 16 Henry and Matt who live 40 miles apart start at noon to walk towards each other at rates of 4 mph and 6 mph respectively. After how many hours will they meet?



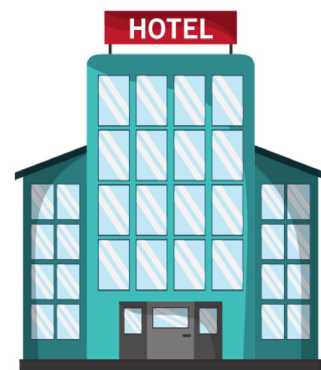


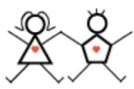
Practice Questions

- 27 Six people work in a hotel. The following table lists the hours worked and the total pay during the weekend:

	Hours Worked	Total Pay
Natalie	5	£10.45
Sam	10	£22.50
Louis	9	£27.45
Martha	12	£28.80
Rick	13	£23.40
Eve	8	£24.80

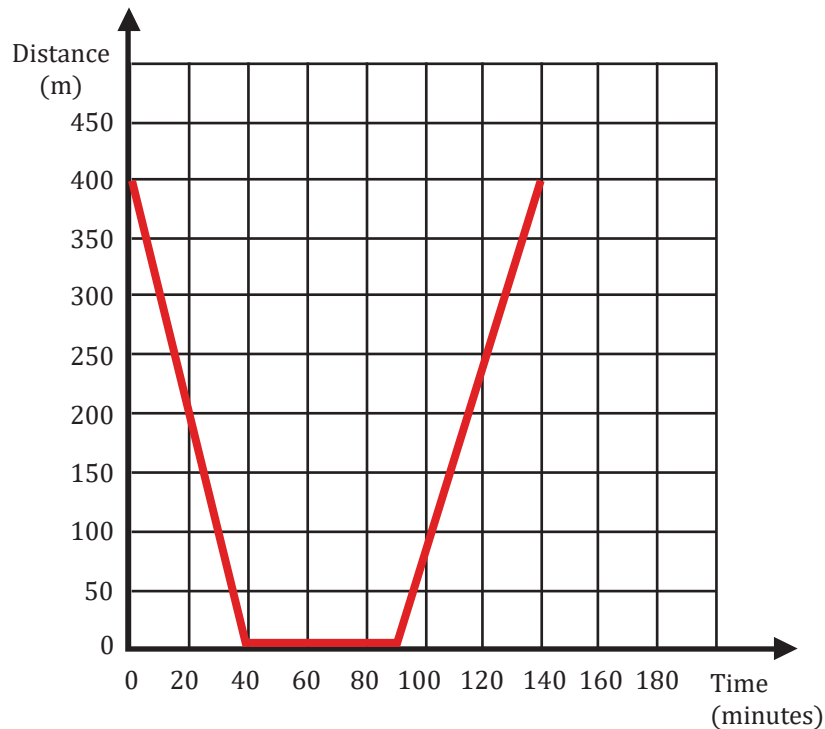
- a) Who is paid the least per hour?
b) Who is paid the most per hour?





Practice Questions

- 35 At lunch break, Janessa walks towards restaurant from office to have her lunch. The distance time graph describes her journey, showing her distance from restaurant.
- How far is restaurant from Janessa's office?
 - How long does it take Janessa to walk restaurant?
 - At what speed does she walk on the way to restaurant?
 - How long does Janessa spend at restaurant?
 - At what speed does she walk back to office?





Keypoints

Distance-Rate-Time Problems

1. Set up the table and fill in the values from the given word problem.

	rate	time	distance
Situation 1			
Situation 2			

2. Calculate the missing values using the formulas:

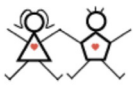


$$\text{Distance} = \text{Speed} \times \text{Time}$$

$$\text{Speed} = \text{Distance} \div \text{Time}$$

$$\text{Time} = \text{Distance} \div \text{Speed}$$

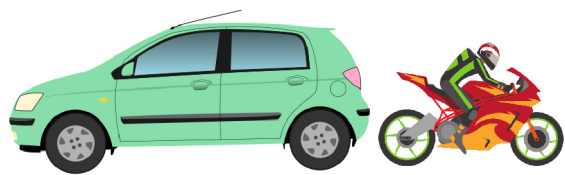
3. Write the equation and solve.

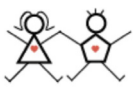


Homework

- 15 Two cycles leave from the same place at the same time and travel in opposite directions. One cycle travels at 12 mph and the other at 16 mph. After how many hours will there be 112 miles apart? [2]

- 16 A bike and a car left the same place and traveled in opposite directions. If the bike is traveling at 50 mph and the car is traveling at 75 mph, in how many hours will they be 375 miles apart? [2]





Only mastermind can solve



Alexander and his friend Olivia live in two different cities which are 57 miles apart.

During Christmas holidays, they planned to cycle towards each other along the same way.

Alexander started at 6:00 AM at ' a ' mph. Starting at 9:00 AM, Olivia cycled at ' b ' mph towards Alexander. They met at 11:00 AM.

If they had both started at 7:30 AM, they would meet at 10:40 AM.

What are the values of a and b ?

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