# Ratios, Measurement and Sequences



Effective Crash Course • Practice Questions • Homework • Past Paper Questions

S/J				
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Fractions

### Chapter 1:

- Simplify Ratio (a:b, a:b:c) Share using a Ratio (a:b, a:b:c)
- Change Ratio to Percentages/Percentages to Ratio
- Equivalent Ratios Relative sizes
- Similarity Maps & Scales Unequal sharing and grouping
- Scale Measuring Units/Drawings/Floor Plans/Maps

1

Robert has eaten 60% of the apple pie. What is the ratio of the part of pie that remains to the part that Robert has eaten?



2  $\frac{1}{12}$  of the balls in the bag are yellow.  $\frac{1}{4}$  of the balls are white.  $\frac{2}{3}$  of the balls are green. Write the ratio of green : white : yellow.







17

# Practice Questions

A small pen has enough ink to write 300 pages. Three small pens can write as many as two medium pens. Three medium pens can write as many as two large pens.

How many pages can be written using a large pen?



18 Elizabeth, Harry and Charles share candies in the ratio of 7 : 11 : 9. Elizabeth gets 16 candies less than Harry. How many candies does Charles get?





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10)



# Homework

If Richard divides £85 between his son and daughter in the ratio 3 : 2, [2] how much money does his daughter get?



11 Adam and Freddie share 80 chocolates in the ratio 5 : 3. How many do they each get ?







5

6



# Practice Questions

Mira eats 5 ice creams in 30 minutes. How many minutes would she take to eat 12 ice creams?



The amount of each ingredient needed to make 16 pastries is given in the table below.

Ingredients	16 Pastries	24 Pastries	
Flour	480 g	g	-
Eggs	8		
Sugar	16 tablespoons	tablespoons	2
Butter	300 g	g	

Complete the table to show how much of each ingredient is needed to make 24 pastries.





a) Paul wants to make 21 cheesecakes. How much butter will he need?

cheese

168 g

b) How many cheesecakes can be made if there is only 224 g of cheese available?

15 It takes a group of 6 workers, 10 days to construct a room. How long would it take to construct a room if there are 15 workers in a group?













purple paint mix 2 litres of red paint for every 3 litres of blue paint

(i) If he uses 6 litres of red paint, how much blue paint should he use?

Answer: ..... litres

(ii) How much blue paint is needed to make 35 litres of purple paint?

Answer: ..... litres

Ref: ISEB, Q21, 11+ Past Paper 2016





7



Rose is making a lemon cake. Part of the recipe for the cake mix is below.

 $\frac{1}{4}$  of the cake mix is sugar  $\frac{1}{2}$  of the cake mix is flour  $\frac{1}{12}$  of the cake mix is lemons



[2]

The rest of the cake mix is made from other ingredients.

If there are 900 grams of cake mix

(a) How many grams of sugar are there?

Answer.....g

(b) How many grams of ingredients other than lemons, flour and sugar are there?

Answer.....g

Ref: The King's School Chester, Q16, 11+ Past Paper 2

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# Keypoints

f) Fibonacci Numbers: The Fibonacci numbers form a sequence, called the Fibonacci sequence, such that each number is the sum of the two preceding ones, starting from 0 and 1. The simplest is the series

0, 1, 1, 2, 3, 5, 8, ...

g) **Pascal's Triangle:** One of the most interesting number patterns is Pascal's Triangle . To build the triangle, start with "1" at the top, then continue placing numbers below it in a triangular pattern.Each number is the numbers directly above it added together.

The triangle is also symmetrical. The numbers on the left side have identical matching numbers on the right side, like a mirror image. The horizontal sum also doubles each time.







# Keywords

a) Pattern
b) Sequence
c) Linear Number sequence
d) Triangular number
e) Square and Cube Number
f) Geometric Pattern
g) Even and Odd numbers
h) Fibonacci Numbers
i) Prime Numbers
j) Powerful Numbers
k) Palindromic number
l) Armstrong Number
m) Tetrahedral Number
n) Octagonal Number
o) Circular Number





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### Homework

Leaves are growing on a plant in the garden.
Each day the number of leaves triples.
On May 1<sup>st</sup> there are 60 leaves.
On what day does the number of leaves first become more than 100,000?



[2]

[2]

13

What is the missing number in each of these sequences? 4, 12, 36, \_\_\_\_\_\_, 324, 972 2, 9, 17, 26, \_\_\_\_\_\_, 47, 59







# Chapter 3: Answers





c) 170 diagonals

15.	Pattern Number	Number of sticks
	1	8
	2	16
	3	24
	4	32
	7	56



- 17. 49
- 18. a) Pink
  - b) Red
    - c) 4 colours







20. a)

First Octagonal Number	(2 x 1) + 2	1
Second Octagonal Number	(4x4)+2	8
Third Octagonal Number	(6x7)+2	21
Fourth Octagonal Number	(8 x 10) + 2	40

b) Fifth = 65Tenth = 280



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# Practice Questions

9 Robert writes down all the three digit positive integers for which the product of their digits equals 48. What is the difference between the greatest and the smallest of these numbers?



10 Henry wrote different integers from 1 to 9 in each cell of a table. He then calculated the sum of the integers in each of the rows and in each of the columns of the table. Five of his answers were 12, 19, 14, 17, 15 in some order. What was his sixth answer?







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