

CONTENTS

(TOPICS • PROBLEM SOLVING HEURISTICS)

◀ WHOLE NUMBERS

1 ADDITION AND SUBTRACTION (REVIEW)

1.1 Part-Whole Model And Comparison Model	5
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2 FACTORS & MULTIPLES

2.1 Tests of Divisibility	10
2.2 Systematic Listing	14

3 MULTIPLICATION AND DIVISION

3.1 Unit Model Concept	18
3.2 Simplify The Problem	24
3.3 Make A Supposition	29

4 FOUR OPERATIONS

4.1 Difference-Multiple Model Concept	32
4.2 Make-A-Whole Model Concept.....	37
4.3 Internal-Transfer Model Concept	42
4.4 Before-After Model Concept	48
4.5 Restate In Another Way	55

◀ FRACTIONS

5 ADDITION AND SUBTRACTION

5.1 Simplify The Calculation	60
------------------------------------	----

6 FRACTIONS OF A SET

6.1 Unit Model Concept.....	65
-----------------------------	----

7 MIXED PROBLEMS

7.1 Unit Model Concept.....	73
7.2 *Part-Whole Unit Model Concept	76
7.3 Comparison Unit Model Concept	79
7.4 *Parts-And-Units Model Concept	82

« DECIMALS

8 ADDITION AND SUBTRACTION

8.1 Part-Whole Model And Comparison Model	85
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9 MULTIPLICATION AND DIVISION

9.1 Unit Model Concept	89
9.2 Draw A Diagram	97

« AREA AND PERIMETER

10 AREA AND PERIMETER

10.1 Restate In Another Way	100
10.2 Systematic Listing	103

Answer Key & Detailed Solutions	107
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Parents' Workshop Support	127
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FAN-Math New Publications	128
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*More challenging problems especially for advanced pupils.

4 FOUR OPERATIONS

4.1 DIFFERENCE-MULTIPLE MODEL CONCEPT



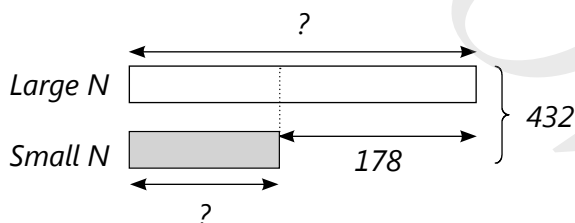
EXAMPLE 1

The total of two numbers is 432.
The difference between the two numbers is 178.

What are the two numbers?

SOLUTION:

Draw a model.



$$432 - 178 = 254$$

$$2 \text{ units} \rightarrow 254$$

$$1 \text{ unit} \rightarrow 254 \div 2 = 127 \text{ (Small Number)}$$

$$127 + 178 = 305 \text{ (Large Number)}$$

The two numbers are 127 and 305.

THINKING MATHEMATICALLY

We draw a model to help visualise the problem.

Represent the smaller number with 1 unit and the large number with (1 equal unit + 178).

How many units represent the total?

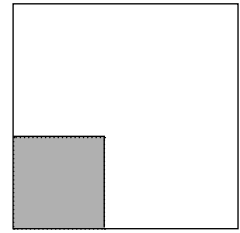
Ans: 2 equal units plus 178.

What do we need to find first?

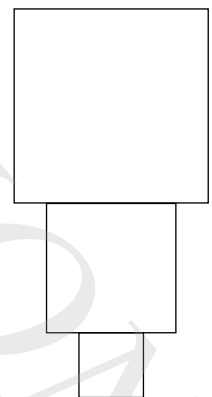
Ans: The value of 2 equal units.

By subtracting the difference (178) from the total (432), we get the value of 2 equal units.

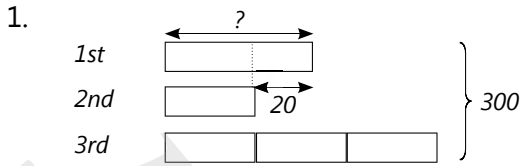
3. The figure is formed by 2 squares. The area of the unshaded part of the figure is 32 cm^2 . The lengths of both squares are whole numbers. Find the area of each square.



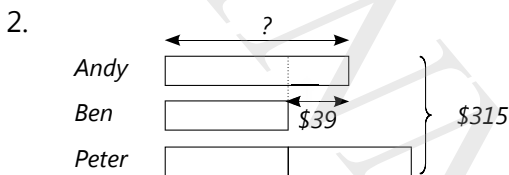
- *4. A garden is formed by 3 square plots of land with a total area of 56 m^2 . Given that the sides of the three plots of land are whole numbers, find the perimeter of the garden.



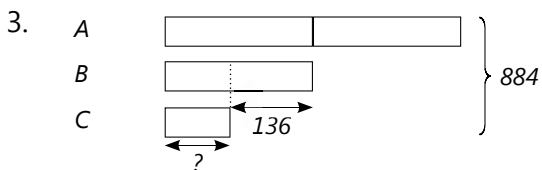
WORKSHEET 4.2



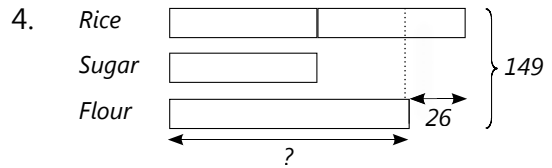
5 units $\rightarrow 300 - 20 = 280$
 1 unit $\rightarrow 280 \div 5 = 56$ (2nd)
 There were 56 storybooks in the 2nd box.



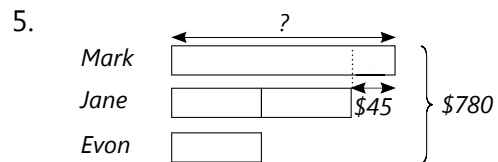
4 units $\rightarrow \$315 - \$39 = \$276$
 1 unit $\rightarrow \$276 \div 4 = \69 (Ben)
 $\$69 + \$39 = \$108$ (Andy)
 Andy saved \$108.



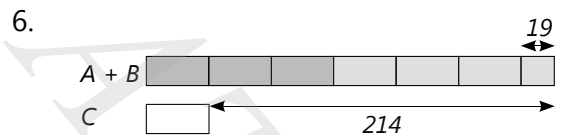
4 units $\rightarrow 884 + 136 = 1020$ cm
 1 unit $\rightarrow 1020 \div 4 = 255$ cm (B)
 $255 - 136 = 119$ cm (C)
 C was 119 cm long.



$149 + 26 = 175$ kg
 5 units $\rightarrow 175$ kg
 1 unit $\rightarrow 175 \div 5 = 35$ kg (sugar)
 2 units $\rightarrow 2 \times 35 = 70$ kg (rice)
 $70 - 26 = 44$ kg (flour)
 The mass of the sack of flour is 44 kg.



5 units $\rightarrow \$780 - \$45 = \$735$
 1 unit $\rightarrow \$735 \div 5 = \147 (Evon)
 2 units $\rightarrow 2 \times \$147 = \294 (Jane)
 $\$294 + \$45 = \$339$ (Mark)
 Mark had \$339.



$214 - 19 = 195$
 5 units $\rightarrow 195$
 1 unit $\rightarrow 195 \div 5 = 39$ (Calvin)
 3 units $\rightarrow 3 \times 39 = 117$ (Bryan)
 $117 + 19 = 136$ (Alan)
 Alan got 136 marbles, Bryan got 117 marbles and Calvin got 39 marbles.