

Question 1

Mom opened a packet of chocolates for her 2 girls, Abi and Nat. Both girls grabbed the chocolates. When Abi noticed that she had more chocolates, she gave 15 chocolates to Nat so that both of them would have an equal number of chocolates. Later, Nat decided to return 12 chocolates to Abi as she felt that Abi deserved the chocolates for her quick reaction. As a result, Nat had only $\frac{2}{3}$ of Abi's chocolates. How many chocolates had Nat at first?

	<u>Abi</u>		<u>Nat</u>
Before	1 unit + 30		1 unit
Change	-15		+15
After	1 unit + 15		1 unit + 15
Change	+12		-12
After	1 unit + 27		1 unit + 3
	3	:	2

$$2(1 \text{ unit} + 27) = 3(1 \text{ unit} + 3)$$

Find difference:

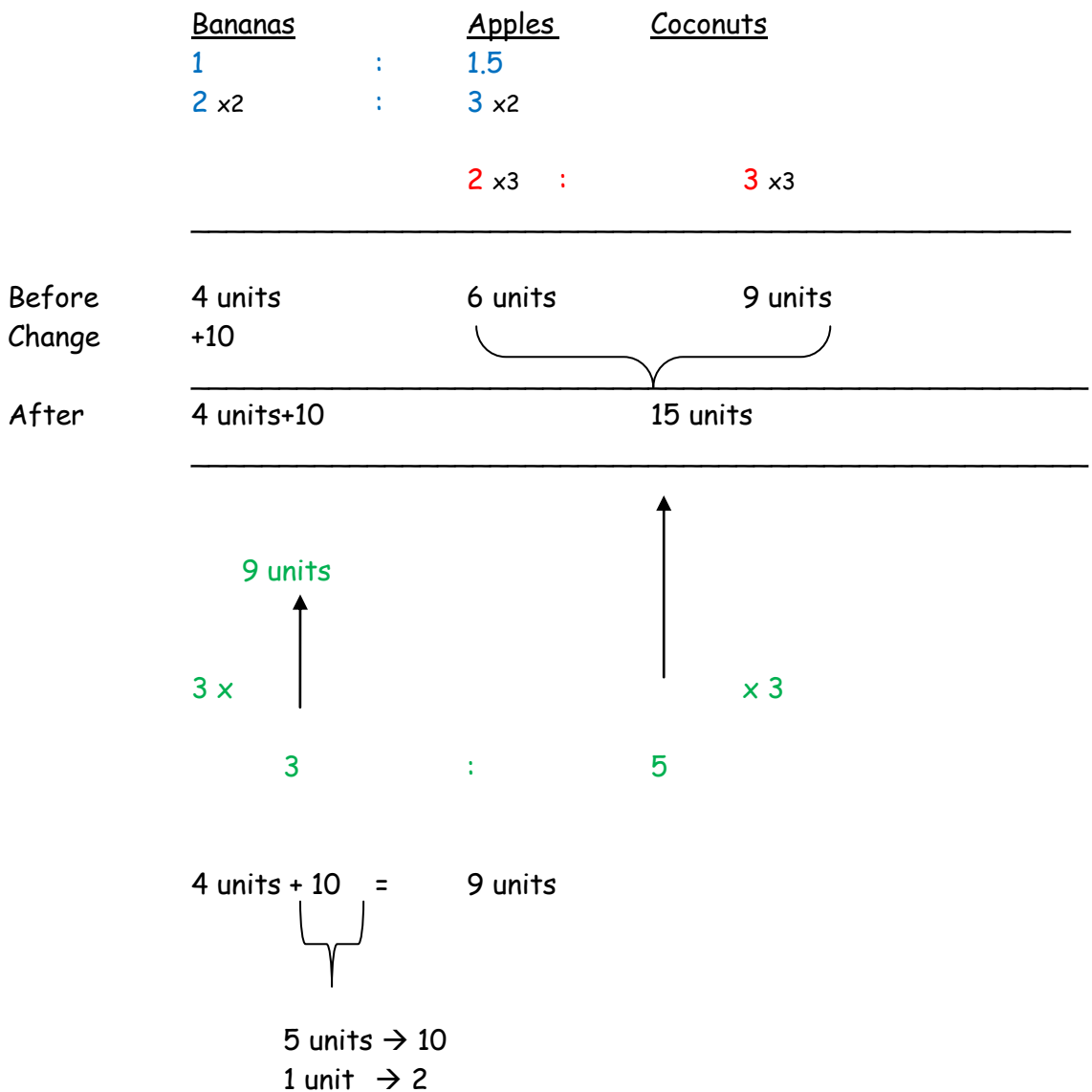
$$2 \text{ units} + 54 = 3 \text{ units} + 9$$

$$\begin{aligned} 3 \text{ units} - 2 \text{ units} &= 54 - 9 \\ 1 \text{ unit} &= 45 \end{aligned}$$

Ans. At first, Nat had 45 chocolates.

Question 2

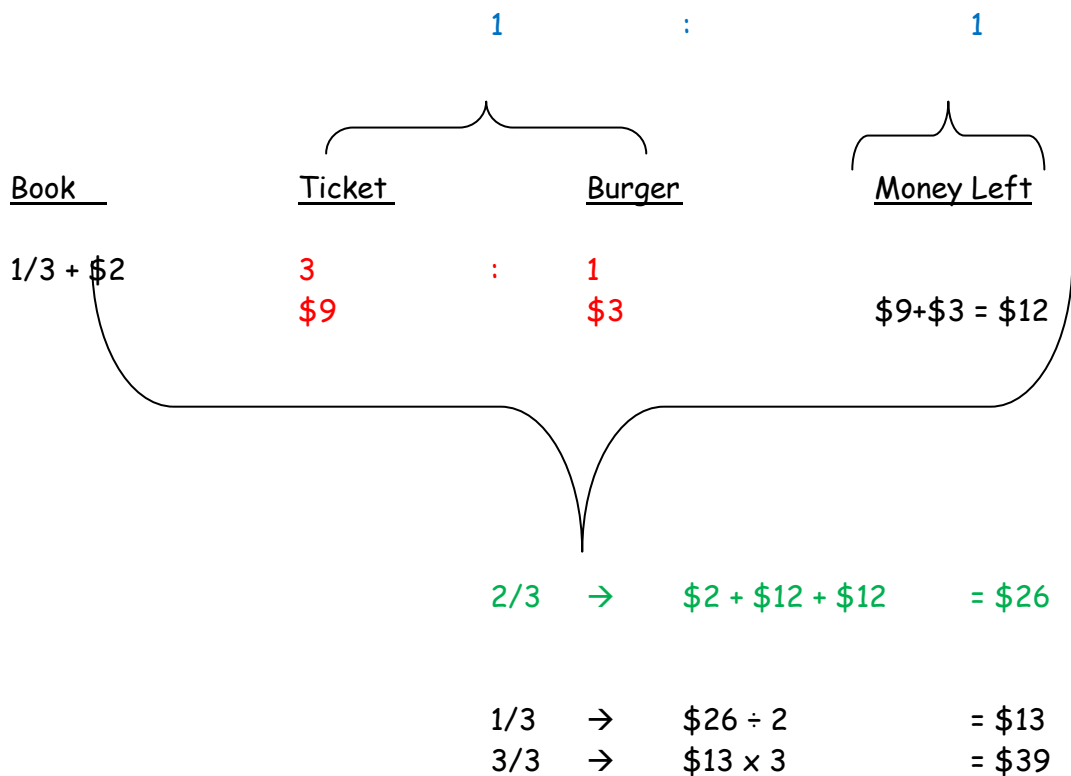
Before Grandpa came home, Ryan and Ethan counted the number of each type of fruits in the basket. Ryan counted that there were $1\frac{1}{2}$ times as many apples as bananas in the basket, while Ethan noted that he could group every 3 coconuts with 2 apples. When Grandpa came home, he added 10 bananas into the basket. As a result, $\frac{3}{8}$ of the fruits in the basket were bananas. How many apples were in the basket?



Ans. Apples = $6 \times 2 = \underline{12}$

Question 3

Nat had some money. She bought a book with $\frac{1}{3}$ of her money plus \$2. She then spent half of her remaining money on a movie ticket and a burger in the ratio 3:1. The burger cost \$3. How much had Nat at first?



Ans. At first, Nat had \$39.

Question 4

Abi and Eli had an equal number of sweets. Each day, Abi ate 2 sweets and Eli ate 3 times as many as Abi. When Abi had 54 sweets left, Eli had 34 sweets left. How many sweets had Eli at first?

<u>Abi</u>		<u>Eli</u>
1 unit + 54	=	3 units + 34

Find difference: $3 \text{ units} - 1 \text{ unit} = 54 - 34$

$$2 \text{ units} = 20$$

$$1 \text{ unit} = 10$$

Ans. At first, Eli had $10 + 54 = \underline{64}$ sweets.

Question 5

2 boxes A and B had some marbles. If 21 marbles were transferred from A to B, both boxes would have an equal number of marbles. If 21 marbles were transferred from B to A, A would have 3 times as many marbles as B. How many marbles were in each box?

	Case 1		Case 2	
Before	<u>A</u> 1 unit + 42	<u>B</u> 1 unit	<u>A</u> 1 unit + 42	<u>B</u> 1 unit
Change	-21	+21	+21	-21
After	<hr/> 1 unit + 21 <hr/>	<hr/> 1 unit + 21 <hr/>	<hr/> 1 unit + 63 <hr/>	<hr/> 1 unit - 21 <hr/>

$$1 \text{ unit} + 63 = 3(1 \text{ unit} - 21)$$

$$1 \text{ unit} + 63 = 3 \text{ units} - 63$$

$$\begin{array}{r}
 1 \text{ unit} + 63 \\
 +63 \\
 \hline
 1 \text{ unit} + 126
 \end{array}
 \qquad
 \begin{array}{r}
 3 \text{ units} - 63 \\
 +63 \\
 \hline
 3 \text{ units}
 \end{array}$$

$$\begin{array}{l}
 2 \text{ units} = 126 \\
 1 \text{ unit} = 63
 \end{array}$$

Ans. Box A = $63+42 = \underline{105}$ marbles
 Box B = $\underline{63}$ marbles

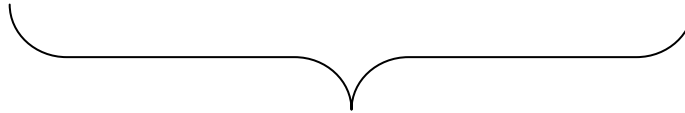
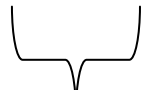
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Question 6

Abi saved some money in \$2, \$5 and \$10 notes. The value of the \$2, \$5 and \$10 notes was in the ratio 8:10:3. After taking out $\frac{3}{4}$ of the \$2 notes for fees and 18 of the \$5 notes for books, she had \$390 left. How much of the \$2 notes has she left?

	<u>\$2</u>	<u>\$5</u>	<u>\$10</u>	
Value of notes	8units	10units	3units	$\frac{3}{4} \times 8\text{units}$
Change	-6units	-\$90		= 6units
After	2units	10units-\$90	3units	$18 \times \$5 = \90
				
	$2\text{units} + 10\text{units} - \$90 + 3\text{units} = \$390$			
	$15\text{units} - \$90 = \390			
				
	$15 \text{ units} = \$390 + \$90 = \$480$			
	$1 \text{ unit} = \$32$			

Ans. \$2 notes left = $2 \times \$32 = \underline{\$64}$.

Question 7

Eli and Nat had \$128 altogether. Eli spent $\frac{1}{2}$ his money on a watch. Nat spent $\frac{2}{5}$ of her money on a bag. The bag cost \$8 more than the watch. How much had Eli at first?

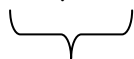
	<u>Eli</u>		<u>Nat</u>		<u>Total</u>
Before	2 units		5 parts		→ \$128
Spent	1 unit (watch)		2 parts (bag) → \$8 more than watch		

$$\begin{aligned} 1 \text{ unit} &= 2 \text{ parts} - \$8 \\ 2 \text{ units} &= 4 \text{ parts} - \$16 \end{aligned}$$

$$\underbrace{2 \text{ units} + 5 \text{ parts}} = \$128$$

Substitution:

$$\begin{aligned} 4 \text{ parts} - \$16 + 5 \text{ parts} &= \$128 \\ 9 \text{ parts} - \$16 &= \$128 \end{aligned}$$



$$\begin{aligned} 9 \text{ parts} &= \$128 + \$16 = \$144 \\ 1 \text{ part} &= \$16 \end{aligned}$$

$$\begin{aligned} 1 \text{ unit} &= 2 \text{ parts} - \$8 \\ &= 2 \times \$16 - \$8 \\ &= \$24 \end{aligned}$$

Ans. At first, Eli had $2 \times \$24 = \underline{\$48}$.

Question 8

Ryan reared 24 more hens than ducks. He sold $\frac{1}{4}$ of the hens and $\frac{1}{5}$ of the ducks. He had sold 22 more hens than ducks. How many hens had Ryan at first?

	<u>Hens</u>	<u>Ducks</u>
Before	4 units \rightarrow 24 more than ducks	5 parts
Sold	1 unit \rightarrow 22 more than ducks	1 part

$$\begin{array}{l} 1 \text{ unit} \quad = 1 \text{ part} + 22 \\ 4 \text{ units} \quad = 4 \text{ parts} + 88 \\ 4 \text{ units} \quad = 5 \text{ parts} + 24 \\ \hline 4 \text{ parts} + 88 = 5 \text{ parts} + 24 \end{array}$$

$$\begin{array}{l} \text{Find diff:} \quad 5 \text{ parts} - 4 \text{ parts} \quad = \quad 88 - 24 \\ \quad \quad \quad 1 \text{ part} \quad \quad \quad = \quad 64 \\ \quad \quad \quad 1 \text{ unit} \quad \quad \quad = \quad 64 + 22 = 86 \end{array}$$

Ans. At first, Ryan had $4 \times 86 = \underline{344}$ hens.

Question 9

Abi received an extra allowance of \$552 in January which doubled her current monthly allowance. She spent double the usual of \$268 on food and transport. She bought a discman which cost $\frac{1}{3}$ of her allowance. She then gave 20% of what she had left to each of her 2 brothers and saved the rest. How much did she save in January?

<u>January Allowance</u>	<u>Food & Tpt</u>	<u>Discman</u>	<u>2 Brothers</u>	<u>Saved</u>
$2 \times \$552 = \1104	$2 \times \$268 = \536	$\frac{1}{3} \times \$1104 = \368	$2 \times (20\% \text{ of } \$200) = 40\% \text{ of } \200	$60\% \text{ of } \$200 = 0.6 \times \$200 = \underline{\$120}$

$\$1104 - \$536 - \$368 = \200

Ans. Abi saved \$120.

Question 10

Nat and Abi had a total of 312 stamps. Nat gave $\frac{5}{8}$ of her stamps to Abi. Abi in return gave $\frac{3}{7}$ of the total number of stamps she had to Nat. In the end, both girls had an equal number of stamps. How many stamps had Nat at first?

Working Backwards (from back to front)

	<u>Nat</u>	<u>Abi</u>	
After	$312 \div 2 = 156$	156 (4/7)	
Before A gave N $\frac{3}{7}$	$156 - 117$ $= 39$ ($\frac{3}{8}$)	$156 + 117$ $= 273$	$\frac{4}{7} \rightarrow 156$ $\frac{1}{7} \rightarrow 39$ $\frac{3}{7} \rightarrow 117$
Before N gave A $\frac{5}{8}$	$39 + 65$ $= 104$	$273 - 65$ $= 208$	$\frac{3}{8} \rightarrow 39$ $\frac{1}{8} \rightarrow 13$ $\frac{5}{8} \rightarrow 65$
At first	<u>104</u>	208	

Ans. At first, Nat had 104 stamps.

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