

# Non-Routine Questions 1

## NOTES

### Heuristics: The Before-After Concept

The Before-After concept lists all the relevant data before and after an event. By listing these data, students can compare the differences and eventually find answers to the problems. Usually, the Before-After concept and the mathematical model go hand in hand. Note that the Before-After concept can only be applied to certain types of mathematical word problems. Such mathematical word problems train the students to think sequentially.

Let's see how we can solve the following mathematical word problem using this concept.

Kelly has four times as much money as Joey. After Kelly uses some money to buy a tennis racket and Joey uses \$30 to buy a pair of sports shorts, Kelly still has twice as much money as Joey. If Joey has \$98 at first,

- (a) how much money does Kelly have in the end?
- (b) how much money does Kelly spend on the tennis racket?

### Solution:

#### Before

Kelly	<input type="text"/>
Joey	<input type="text" value="\$98"/>

#### After

Kelly	<input type="text"/>
Joey	<input type="text"/>

$\underbrace{\hspace{1.5cm}}_{\$98 - \$30}$

- (a)  $\$98 - \$30 = \$68$   
 $2 \times \$68 = \$136$   
Kelly has **\$136** in the end.

- (b)  $4 \times \$98 = \$392$   
 $\$392 - \$136 = \$256$   
Kelly spends **\$256** on the tennis racket.

**Do these questions on another piece of paper.**

1. The number of eggs sold by Mrs Bowles was observed in the pattern shown below.

Fill in each box with the correct answer.

<b>Day</b>	1	2	3	4	5	6	7	8
<b>Number of eggs sold</b>	15	25		48	61		90	

2. Nancy is four times as old as Jenny. Jenny is 3 years older than Ernest. If their total age is 57, how old will Jenny be in four years' time?
3. When I divide Number A by Number B, the answer is 6 with remainder 1. If Number A is less than 30 and Number B is less than 10, what are numbers A and B?
4. I am a 5-digit number. My first digit is 2 more than the last digit but 2 less than my second digit. My second digit is the third multiple of 3 while my fourth digit is the second multiple of 3. My third digit is the difference between my second and fourth digits. What number am I?
5. The product of 2 numbers is 600. The sum of the two numbers is 50. What are the 2 numbers?
6. Jerry scored six times higher than Kenny in an English test. Jason's mark in the same test was the sixth multiple of 10. If the three boys scored a total of 172, what was Jerry's mark in the test?
7. The difference of two numbers is 132. When one of the numbers is divided by the other, the quotient is 12. What are the two numbers?
8. Joan wants to buy a bag. She saves \$2 in the first week. She saves \$4 in the second week. She saves \$6 in the third week and so on. In order to buy the bag, she needs to save for 8 weeks following this pattern. How much does the bag cost?

9. I am a 4-digit number. All my digits are factors of 8. The product of the first and last digits is the fourth multiple of 8. The second digit is 3 less than the last digit. If the first digit is the largest number, what number am I?
10. Place the first six multiples of 6 in each box so that the sum of each row is equal to the 10th and 11th multiples of 6.

			10th multiple of 6
			11th multiple of 6

11. Mr Cole earns twice as much as his wife. Mrs Cole earns twice as much as her sister. If Mrs Cole's sister earns \$1255 a month, how much do the three of them earn in a year?
12. The clock below shows the time Helen wakes up in the morning. When the minute hand goes through a turn of  $150^\circ$ , Helen takes her breakfast. At what time does Helen take her breakfast?

