

Non-Routine Questions 2

Notes

Heuristics: Guess and Check

One of the most important and effective problem-solving techniques is 'Guess and Check'. It is also known as 'Trial and Error'. As the name 'Guess and Check' suggests, you have to guess the answer to a mathematical problem and check if that guess is correct. If the guess is wrong, you will have to make another guess. This will continue until you check that your guess is correct.

It is neat and beneficial to keep a record of all the guesses and checks in a table. In addition, a 'Comments' column should be included. This will enable you to analyze your guess (if it is too high or too low) and improve on the next guess. The 'Guess and Check' problem-solving technique can be tiresome without systematic or logical guesses.

Below are some suggested steps when working on this technique.

Step 1: Information gathering

Finding out the key information and questions in the problem.

Step 2: Create the table in this format

Guess	Check	Comments

Step 3: Guess and check

Make a guess and check the answer. Leave a comment like 'too high' or 'too low'. Repeat the step again when you check that your guess is wrong. Be mindful not to make too many guesses as it can be exhausting. Make sure you improve on your guess each time after a check.

There are some word problems in this chapter that you can apply this problem-solving technique. Identify these problems and practise solving them using this technique.

Do these questions on another piece of paper.

1. The average of four different numbers is 4.4. Each number is bigger than the other number by 1.1. Find the smallest number.
2. Y is a number between 5 and 20. When Y is divided by 2, 3 and 6, it will have a remainder of 1. What are the possible values of Y?
3. I am a 4-digit number.
 - (a) My first digit is the greatest odd digit and is the sum of my second and third digits.
 - (b) My last digit is 60% of my third digit.
 - (c) My second digit is the only even number.
 - (d) The sum of my four digits is 21.What am I?

4. X is a number between 70 and 100. When X is divided by 3, it has a remainder of 1. When X is divided by 6, it also has a remainder of 1. What is the greatest possible value of X?
5. Mr Whitney bought 6 tennis racquets and a basketball for \$390. Mr Jackson bought 3 similar tennis racquets and an identical basketball for \$225. How much did a tennis racquet and basketball cost?
6. In order to win the grand prize, Benny has to crack this secret code. Given the clues, help Ben to crack the code.

8 3 6 5

- (a) The third digit is greater than the second digit.
- (b) The difference is 3 when the third digit is subtracted from the fourth one.
- (c) When the sum of all the numbers is divided by 5, it has a remainder of 3.
- (d) When the sum of all the numbers is divided by 6, it also has a remainder of 3.

7. Joyce bought some sweets. The number of sweets could be distributed equally among 6, 8 or 12 children. If the number of sweets was between 40 and 60, how many sweets did Joyce buy?
8. I am a 7-digit number. Given the clues below, what am I?
- (a) The last digit is the smallest whole number.
 - (b) The first digit is an even number and a product of the third and fifth digits.
 - (c) The second digit is an odd number and a difference between the fourth and sixth digits.
 - (d) The sum of all the digits is 32.
 - (e) The sum of the first 3 digits is the same as the sum of the last 3 digits.
 - (f) All the digits are different.
9. When number Z is divided by 5, its quotient is a multiple of 3. The sum of the quotient and 3 is 24. The difference of the quotient and 3 is 18. Find number Z.
10. Aunt Eunice made some orange juice. She gave 30% of the orange juice to her neighbours. Some orange juice was consumed by her children. The amount of orange juice consumed by her children was $\frac{11}{10}$ more than the amount of orange juice given to her neighbours. If there were 315 ml of orange juice left, how much orange juice did Aunt Eunice make?
11. The average of three different numbers is $36\frac{1}{3}$. The second number is $\frac{2}{5}$ more than the first number. The third number is $\frac{2}{5}$ more than the second number. Find the largest number.
12. 20 pizzas and a box of chicken wings cost \$227.90. 18 pizzas and a box of chicken wings cost \$206.10. How much do 4 pizzas and 4 boxes of chicken wings cost?