

how to do short division

How to do short division is a fundamental arithmetic skill that simplifies the process of dividing large numbers by smaller ones. Unlike long division, which can be more complex and time-consuming, short division offers a quicker method for performing division, especially when working with single-digit divisors. In this article, we will explore the concept of short division, how to perform it step-by-step, common pitfalls to avoid, and tips for mastering this technique.

Understanding Short Division

Short division, also known as the bus stop method, is a technique used for dividing numbers, typically involving a single-digit divisor. This method allows for a more efficient calculation by breaking down the division process into manageable steps. It is particularly useful for mental math and quick calculations, making it an essential skill for students and professionals alike.

When to Use Short Division

Short division is best suited for:

- Dividing by a single-digit number (1-9).
- Situations where the dividend (the number being divided) is relatively small or manageable.
- Quick calculations where an exact quotient is required without extensive work.
- Estimating results when precision is not critical.

Steps for Performing Short Division

The process of short division can be easily broken down into a series of steps. Here's how to do it:

Step 1: Set Up the Division

- Write the dividend (the number to be divided) under the division symbol (the bus stop).
- Place the divisor (the number you are dividing by) outside the division symbol.

For example, to divide 84 by 4, you would write:

...

$$\begin{array}{r} 4 \overline{) 84} \\ \end{array}$$

Step 2: Divide the First Digit

- Look at the first digit of the dividend. Determine how many times the divisor can fit into this digit.
- If the divisor is larger than the first digit, look at the first two digits of the dividend instead.

In our example with 84 divided by 4, we start with the digit 8:

- 4 goes into 8 exactly 2 times. Write the 2 above the division symbol.

$$\begin{array}{r} \text{...} \\ 2 \\ \hline 4 \overline{) 84} \\ \text{...} \end{array}$$

Step 3: Multiply and Subtract

- Multiply the divisor by the quotient (the number you just wrote above the division symbol).
- Write this product below the digit(s) you just divided.
- Subtract this product from the digit(s) above.

Continuing with our example:

- $2 \times 4 = 8$. Write 8 below the 8 in 84.
- Subtract 8 from 8, which gives you 0.

$$\begin{array}{r} \text{...} \\ 2 \\ \hline 4 \overline{) 84} \\ -8 \\ \hline 0 \\ \text{...} \end{array}$$

Step 4: Bring Down the Next Digit

- If there are more digits in the dividend, bring down the next digit next to the remainder (in this case, 0).
- Write this new number next to the remainder.

In our example, we bring down the next digit, which is 4, making it 04.

$$\begin{array}{r} \text{...} \\ 2 \\ \hline \end{array}$$

$$\begin{array}{r}
 4 \overline{) 84} \\
 -8 \\
 \hline
 04 \\
 4
 \end{array}$$

Step 5: Repeat the Process

- Now, repeat the process with this new number. Determine how many times the divisor fits into this new number.

- 4 goes into 4 exactly 1 time. Write the 1 above the division symbol next to the 2.

$$\begin{array}{r}
 21 \\
 4 \overline{) 84} \\
 -8 \\
 \hline
 04 \\
 -4 \\
 \hline
 0 \\
 0
 \end{array}$$

- Multiply and subtract again:

- $1 \times 4 = 4$. Subtract 4 from 4, which gives you 0.

$$\begin{array}{r}
 21 \\
 4 \overline{) 84} \\
 -8 \\
 \hline
 04 \\
 -4 \\
 \hline
 0 \\
 0
 \end{array}$$

Step 6: Write the Final Answer

- Once you have brought down all the digits and have no remainder, the number written above the division symbol is the quotient.

In this case, 84 divided by 4 equals 21.

Practice Problems

Practicing short division can help solidify your understanding. Try solving these problems using the short division method:

1. $72 \div 6$
2. $96 \div 8$
3. $54 \div 9$
4. $125 \div 5$
5. $144 \div 12$

After attempting these, you can check your answers:

1. 12
2. 12
3. 6
4. 25
5. 12

Common Pitfalls to Avoid

While short division is a straightforward method, there are several common mistakes that learners may encounter. Being aware of these pitfalls can help you avoid them:

- Forgetting to bring down the next digit: Always make sure to bring down the next digit if there are more digits in the dividend.
- Incorrect subtraction: Double-check your subtraction process to ensure accuracy. Mistakes in this step can lead to incorrect answers.
- Misreading the divisor: Ensure that you correctly identify the number you are dividing by, especially with larger numbers.
- Not writing the quotient correctly: Take care to place the quotient digits in the correct position above the division symbol.

Tips for Mastering Short Division

To achieve proficiency in short division, consider the following tips:

- Practice Regularly: The more you practice, the more comfortable you will become with the process. Try various problems with different divisors and dividends.
- Use Visual Aids: Drawing the bus stop method can help visualize the steps involved in the division process.
- Check Your Work: After completing a division problem, multiply the quotient by the divisor to check if you arrive back at the original dividend.
- Work with Friends or Family: Collaborating with others can provide additional insight and make practice more enjoyable.

Conclusion

Short division is a valuable skill that simplifies the process of dividing numbers efficiently and quickly. By following the outlined steps and practicing regularly, anyone can master this technique. Whether in a classroom setting or while performing everyday calculations, short division can be a handy tool in your arithmetic toolkit. So grab a pencil and paper, and start practicing short division today!

Frequently Asked Questions

What is short division?

Short division is a method of dividing numbers that simplifies the process by using a single digit divisor and performing the calculation step by step, often without writing down all intermediate steps.

How do you start short division?

To start short division, write the dividend (the number being divided) and place the divisor (the number you are dividing by) outside the division symbol. Begin from the leftmost digit of the dividend.

What if the divisor is larger than the first digit of the dividend?

If the divisor is larger than the first digit, you should take the next digit of the dividend to create a larger number that can be divided by the divisor.

How do you handle remainders in short division?

When you cannot divide evenly, write the remainder next to the quotient. You can also express it as a fraction by placing the remainder over the divisor.

Can you give an example of short division?

Sure! For example, to divide 84 by 4, you would see how many times 4 goes into 8 (2 times, write 2), then bring down 4, and see how many times 4 goes into 4 (1 time, write 1), resulting in a final answer of 21.

What are the benefits of using short division?

The benefits of short division include its simplicity, speed, and the ability to perform calculations mentally or on paper without needing to write out the entire long division process.

Is short division suitable for large numbers?

Yes, short division can be used for larger numbers, but it may require more steps and careful tracking of remainders, especially if you are dealing with multi-digit dividends.

How can I practice short division effectively?

You can practice short division by using worksheets, online quizzes, or math apps that provide problems of varying difficulty levels, allowing you to improve your skills gradually.

Are there any tips for mastering short division?

To master short division, practice regularly, focus on your times tables for quick reference, and break down larger problems into manageable parts for easier calculations.

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