GCSE Maths – Number

Estimation and Approximation

Worksheet

NOTES

SOLUTIONS

This worksheet will show you how to work out different types of estimation and approximation questions. Each section contains a worked example, a question with hints and then questions for you to work through on your own.

Section A

Worked Example

Round 94,721 to the nearest 1000

Step 1: Identify which digits we need to look at for the required rounding.

When rounding to the nearest 1000, we look at the digit to the right of the thousand's column. This is the hundreds digit.

$$94,\mathbf{7}21$$

The 7 represents the hundreds digit.

Step 2: Now, determine whether we round up or down.

$$7 > 5$$

Therefore, we round up the 'thousands' digit. This means we round up 4 thousand to 5 thousand.

Step 3: Now we change all the numbers to the right of the rounded digit to 0s.

$94{,}721$ *to the nearest thousand is* $\mathbf{95,000}$.

Guided Example

Round 578,942,342 to the nearest million

Step 1: Identify which digits we need to look at for the required rounding.

Step 2: Now, determine whether we round up or down.

Step 3: Now we change all the numbers to the right of the rounded digit to 0s.

Now it's your turn!
If you get stuck, look back at the worked and guided examples.

1. Round 678450 to the nearest 1000

2. Round 0.048342 to 3 decimal places

3. Round 194.4532 to the nearest whole number

4. Round 0.00403093 to 3 significant figures

5. Round 0.0888991 to 4 significant figures

Section B

Worked Example

Estimate 603×31

Step 1: Round each number to 1 significant figure.

Rounding 603 *to 1 significant figure:* $603 \approx 600$
Rounding 31 *to 1 significant figure:* $31 \approx 30$

Step 2: Substitute the rounded values into the equation.

$$603 \times 31 \approx 600 \times 30$$

Step 3: Perform the calculation of this new expression.

$$600 \times 30 = \mathbf{18000}$$

The estimation of 603×31 is 18,000

Guided Example

Estimate $742998 \div 709$

Step 1: Round each number to 1 significant figure.

Step 2: Substitute the rounded values into the equation.

Step 3: Perform the calculation of this new expression.

Now it's your turn!
If you get stuck, look back at the worked and guided examples.

6. Estimate $24638 + 44282$

7. Estimate 44829×868

8. Estimate $679348 \div 723$

9. Estimate $908629 \div 0.0722$

10. Estimate $\dfrac{60.3 \div 2.88}{4.94}$

11. Estimate $\frac{20.1 \times 698.3}{19.87 \times 5.28}$

12. Estimate $\frac{8.8 \times 20.3}{8.996 - 6.03}$

13. In a cinema there are 39 rows and in each row there are 28 seats.
Each cinema ticket costs £9.75
Work out an estimate for the total income from ticket sales.

14. Eleanor wants to buy 6 rubbers and 4 pencils. The rubbers cost £0.94 each and the pencils cost 52p each.

Find an estimate for how much this will cost Eleanor in £.