GCSE Maths – Number

Four Operations

Worksheet

NOTES

SOLUTIONS

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

Section A – Integers

Worked Example 1

Work out $456 + 346$

Step 1: Put the numbers into columns.

$$\begin{array}{rccc} & 4 & 5 & 6 \\ + & 3 & 4 & 6 \\ \hline \end{array}$$

Step 2: Starting with the right, add 6 onto 6. This gives us 12 which is equal or above 10, meaning we have to carry the 1 into the tens column, leaving a 2 in the units column.

$$\begin{array}{rccc} & 4 & 5 & 6 \\ + & 3 & 4 & 6 \\ \hline & & & 2 \end{array}$$

Step 3: In the tens column, we add 4 onto 5, giving 9 (representing 40+50=90). But, since we have carried an 'extra' 10 from the previous column, we get 10 (representing 100). Again, we must carry this into the hundreds column and leave a 0 in the tens column.

$$\begin{array}{rccc} & 4 & 5 & 6 \\ + & 3 & 4 & 6 \\ \hline & & 0 & 2 \end{array}$$

Step 4: Finally, in the leftmost column, add the 3 onto the 4 to get 7 (representing 300+400 = 700). Since we carried an 'extra' 100 from the previous column we get 8 (representing 800).

$$\begin{array}{rccc} & 4 & 5 & 6 \\ + & 3 & 4 & 6 \\ \hline & 8 & 0 & 2 \end{array}$$

Hence, we have that $456 + 346 = 802$.

Guided Example 1

Work out $782 - 234$

Step 1: Put the numbers into columns. Here, make sure the smaller number is placed underneath the larger number.

Step 2: Starting from the rightmost column, calculate the difference between the two numbers in each column, deciding whether or not you need to 'borrow' a ten from the next column along. Do this for all three columns.

Step 3: Deduce the final answer.

Worked Example 2

Calculate 42×56

Step 1: Put the numbers into a grid:

×	40	2
50		
6		

Step 2: Multiple each of the numbers in the top row with each of the numbers in the leftmost column, filling in the grid.

×	40	2
50	2000	100
6	240	12

Step 3: Next, sum up all the numbers on the inside of the grid.

In this case we want $2000 + 100 + 240 + 12$. *This can be done mentally or by using the column method.*

$$2000 + 100 + 240 + 12 = 2352$$

Hence, $\mathbf{42 \times 56 = 2352}$.

Guided Example 2

Calculate 13×27

Step 1: Put the numbers into a grid

Step 2: Multiple each of the numbers in the top row with each of the numbers in the leftmost column, filling in the grid

Step 3: Add up all the numbers on the inside of the grid to find the total.

Now it's your turn!

If you get stuck, look back at the worked and guided examples.

1. Work out

   a) $78 + 341$

   b) $590 - 233$

   c) 12×45

   d) $564 \div 3$

   e) 75×9

   f) $844 - 261$

   g) $1472 \div 64$

Section B - Fractions

Worked Example

Work out $\frac{4}{3}+\frac{7}{4}$

Step 1: Identify a common denominator for the two fractions.

Looking at the denominators 3 *and* 4*, we see that they share the common multiple of* 12 *(*$3\times4=12$ *and* $4\times3=12$*).*

Step 2: Put both fractions over the common denominator you identified.

With $\frac{4}{3}$*, if we wish to change the denominator into 12, we multiply it by 4. This means we must also multiply the numerator by 4 otherwise the fraction will not be equivalent to the original one. Hence,*

$$\frac{4}{3}=\frac{4}{3}\times\frac{4}{4}=\frac{16}{12}$$

Similarly, with $\frac{7}{4}$*, we multiply the top and bottom by 3:*

$$\frac{7}{4}=\frac{7}{4}\times\frac{3}{3}=\frac{21}{12}$$

Step 3: Now simply add the numerators of the fraction.

$$\frac{4}{3}+\frac{7}{4}=\frac{16}{12}+\frac{21}{12}=\frac{16+21}{12}=\frac{37}{12}$$

Guided Example

Work out $\frac{7}{9}\div\frac{4}{3}$

Step 1: Flip the second fraction in the question around so that the numerator becomes the denominator, and the denominator becomes the numerator.

Step 2: Now, you can change the divide sign to a multiply sign. Then, multiply the two fractions together.

Step 3: Simplify your answer by finding any common factors between the numerator and denominator.

Now it's your turn!

If you get stuck, look back at the worked and guided examples.

2. Work out:

a) $\frac{1}{2}+\frac{5}{6}$

b) $\frac{6}{7}+\frac{8}{21}$

c) $\frac{3}{2}+9$

d) $\frac{8}{3}+2\frac{4}{7}$

e) $\frac{7}{9}-\frac{2}{3}$

f) $\frac{9}{11}-\frac{1}{14}$

g) $\frac{3}{7}-\frac{2}{5}$

h) $\frac{7}{11}-1\frac{4}{3}$

i) $\frac{9}{3} \div \frac{3}{2}$

j) $\frac{8}{5} \times \frac{3}{9}$

k) $\frac{6}{11} \times \frac{2}{7}$

l) $\frac{9}{5} \div \frac{6}{13}$

m) $\frac{3}{10} \times \frac{20}{9}$

n) $\frac{8}{5} \times \frac{3}{9}$

o) $1\frac{3}{4} \times \frac{9}{2}$

Section C – Decimals

Worked Example 1

Work out $1.234 + 4.321$

Step 1: Put the numbers, and decimal place, into columns.

$$\begin{array}{rccccc} & 1 & . & 2 & 3 & 4 \\ + & 4 & . & 3 & 2 & 1 \\ \hline \end{array}$$

Step 2: Proceed as normal with column addition.

$$\begin{array}{rccccc} & 1 & . & 2 & 3 & 4 \\ + & 4 & . & 3 & 2 & 1 \\ \hline & 5 & . & 5 & 5 & 5 \end{array}$$

Hence, $1.234 + 4.321 = \mathbf{5.555}$

Guided Example 1

Work out $9.540 - 4.348$

Step 1: Remove the decimal place and proceed with 9540 – 4348. The decimal place can be removed by multiplying each number by a certain power of 10.
Use any method of subtraction, such as column subtraction to do the calculation.

Step 2: Put the decimal back in to the correct place by dividing your answer to Step 2 by how many powers of 10 you multiplied by in Step 1.

Worked Example 2

Work out 4.5×8.9

Step 1: Identify the number of decimal places in the final answer.

Combined, there are two decimal places in these numbers, therefore the answer will have two.

Step 2: Using the grid method, or otherwise, multiply the numbers together, ignoring the decimal places.

$$45 \times 89 = 4005$$

Step 3: Insert the decimal point back into the final answer.

We know the answer will have two decimal places, so we put the decimal place such that two of the numbers in 4005 *are after it:*

$$4005 \rightarrow 40.05$$

Hence, $4.5 \times 8.9 = 40.05$

Guided Example 2

Calculate $14.8 \div 0.4$

Step 1: Convert the decimals into fractions.

Step 2: Calculate the division of the fractions, using the fraction division technique where the second fraction is flipped, and the division sign is changed to a multiplication sign.

Step 3: Simplify the fraction if necessary.

Now it's your turn!

If you get stuck, look back at the worked and guided examples.

3. Work out:

a) $0.436 + 0.761$

b) $9.372 + 0.66$

c) $341.25 + 91$

d) $67.293 - 83.725$

e) $53.298 - 20$

f) $0.4729 - 0.9911$

g) $0.67792 - 3$

h) $51.2 \div 6.4$

i) 9.8×6

j) 4.2×9.5

k) $63.7 \div 9.8$

l) 5.6×2.3

m) 82.73×0.761

Section D – Using BIDMAS

Worked Example

Calculate $5 \times (4 + 1)$

Step 1: Write down what each letter of BIDMAS stands for so you can work out the order of operations.

Brackets
Indices
Division
Multiplication
Addition
Subtraction

Step 2: Since brackets comes first in the BIDMAS order, we do the operation inside the brackets first.

$$(4 \times 1) = 5$$

Step 3: Write out the calculation but replace the $(4 + 1)$ brackets with the value 5 as you calculated this in Step 2.

$$5 \times (4 + 1) = 5 \times (5)$$

Step 4: There is only one operation left (multiplication), so multiply the two values together, giving you your final answer.

$$5 \times (5) = \mathbf{25}$$

Guided Example

Calculate $\mathbf{30 \times (64 \div 8)^2}$

Step 1: Look at the BIDMAS order to identify the order of operations.

Step 2: Carry out the operations in the correct order.

Now it's your turn!

If you get stuck, look back at the worked and guided examples.

4. Work out:

a) $16 \times (24 \div 4)$

b) $42 + (54 \div 9) - (2 \times 7^3)$

c) $5^{(2+1)} \times (23 + 67) - (12 \div 4)$

d) $34 - (6 \times 7) \div 3$

e) $90 + 7 \times 5 - (45 \div 9)$

f) $2^{3\times2} - 6 \div 2 + 7 \times 3$