

Multiplication using the grid method

Method: Partition your numbers (if they're decimals, ignore the decimal point and pretend they're integers). Write one partitioned number along the top of your grid and the other down the side. Multiply the parts to fill in the grid. Add all the answers together. If your starting numbers were decimals, put the decimal point back in so that the answer has the same number of decimal places as the question.

Examples:

$67 \times 24 =$					$41 \times 3.8 =$				
$28.4 \times 1.92 =$									

Division using the bus stop method

Method: Set up the bus stop with the first number underneath and the second number to the left. If the number is large, write out its times table up to 10 down the side for reference. How many times does it go into the first digit? Write the answer above the first digit. Carry the remainder onto the next digit. Continue until there are no more remainders. (If you have a remainder at the end, write some extra decimal places with zeros in them and continue dividing.)

Examples:

$343 \div 7 =$					$42.6 \div 15 =$				
7	3	4	3						
					15 times table:				
$2754 \div 24 =$									

Rounding to whole numbers (integers)

Method: Find the place value column you need to round to (e.g. if rounding to the nearest ten, find the tens column). Draw a dotted line after that column. Look at the digit after the dotted line. If it's 5 or more, round up the digit before the dotted line; otherwise leave it alone (so the number is rounded down). Keep all the other digits before the dotted line as they were and drop all the digits after the dotted line but fill in any empty place value columns with placeholder zeros (up to the units column but not after).

Examples:

Round 47.3 to the nearest **whole number**.

47.3



The next digit is a so we round to

↑
Up or down?

↑
Answer

Round 169.2 to the nearest ten.

Round 647 to the nearest hundred.

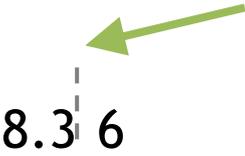
Round 998.96 to the nearest ten.

Rounding to decimal places

Method: Find the place value column you need to round to (e.g. if rounding to the nearest ten, find the tens column). Draw a dotted line after that column. Look at the digit after the dotted line. If it's 5 or more, round up the digit before the dotted line; otherwise leave it alone (so the number is rounded down). Keep all the other digits before the dotted line as they were and drop all the digits after the dotted line. Check that your answer has the right number of decimal places.

Examples:

Round 8.36 to **one decimal place**.



8.3 6

The next digit is a so we round to

 Up or down?  Answer

Round 23.5739 to 3 decimal places.

Round 937.189843 to the 4 d.p.

Round 0.0999 to 2 d.p.

Rounding to significant figures

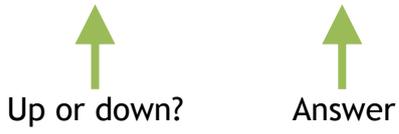
Method: Find the first (most significant) digit in the number which is not a zero. This is the first significant figure. Starting from here, underline the number of significant figures you need. Draw a dotted line after these digits. Round the number at the dotted line as you would for decimal places. Check that the digits you keep are still in the same place value columns as before - the size of the number should not have changed very much.

Examples:

Round 4872 to **one significant figure**.



The next digit is a so we round to



Round 14.67 to one significant figure.

Round 0.00587 to 2 s.f.

Round 2.30791 to 4 s.f.

Estimating calculations

Method: Rewrite the calculation with every number rounded to one significant figure. Then work out the answer to your rounded calculation.

Examples:

38×42	$714 - 68$
$\frac{34.5 + 63.2}{9.7}$	$\frac{(2.1^3 + 6.8^2) - 6.98}{9.51}$

Adding and subtracting negative numbers

Method: Adding a negative is like subtracting so “+ -” becomes “-”. Subtracting a negative is like adding so “- -” becomes “+”.

Examples:

$$3 - 8 =$$

$$7 + -2 =$$

$$12 + -20 =$$

$$2 - -4 =$$

$$3 - 5 - -2 =$$

$$6 - + 3 + - 1 =$$

Multiplying and dividing negative numbers

Method: For multiplying and dividing:

Same signs  Positive answer

Different signs  Negative answer

Examples:

$$3 \times -4 =$$

$$-7 \times -2 =$$

$$12 \div -6 =$$

$$-8 \div -4 =$$

$$-9 \div 3 \times -2 =$$

$$7 \times -1 \div -7 =$$

Order of operations**Method:** Brackets, Indices (Powers), Division and Multiplication (left to right), Addition and Subtraction (left to right).

Examples:

$$4 \times 3 + 2 =$$

$$20 - 12 \div 4 =$$

$$(18 \div 3) + (20 \div 5) =$$

$$2 \times (11 + 9) =$$

$$(12 + 9) \div 3 =$$

$$7 + 2^3 \div 4 =$$

Order of operations with negative numbers

Examples:

$$4 \times 2 - 12 =$$

$$6 + 2 \times (1 - 5) =$$

$$7 - 3 \times 5 =$$

$$(2 - 3) \times 4 - -5 =$$

$$\frac{-8 \times -3}{-6} =$$

$$(-3)^2 =$$

Answers:

Addition using the column method

389, 13 521, 71.72, 653.85

Subtraction using the column method

555, 428, 46.8, 3.15

Multiplication using the grid method

1608, 155.8, 54.528

Division using the bus stop method

49, 2.84, 114.75

Rounding to whole numbers

170, 600, 1000

Rounding to decimal places

23.574, 937.1898, 0.10

Rounding to significant figures

10, 0.0059, 2.308

Estimating calculations

1600, 630, 9, 5

Adding and subtracting negative numbers

-5, 5, -8, 6, 0, 2

Multiplying and dividing negative numbers

-12, 14, -2, 2, 6, 1

Order of operations

14, 17, 10, 40, 7, 9

Order of operations with negative numbers

-4, -2, -8, 1, -4, 9

Teaching notes:

Either print directly as a booklet, or print the pages 2 to a sheet, double sided and hole punch them to bind them into a booklet. Pupils then complete the examples and add annotations to create a revision booklet. Encourage use of colour! You can add more pages so they can create pages on other topics throughout the year.