Rounding to a Given Number of Decimal Places

Prior Knowledge:

- It may be useful to know how to round to the nearest 10, 100 and 1000.
- Place values.

There are two key rounding rules which you should know:

If the deciding digit is less than 5 (0, 1, 2, 3 or 4), we round down.

If the deciding digit is 5 or more (5, 6, 7, 8 or 9), we round up.

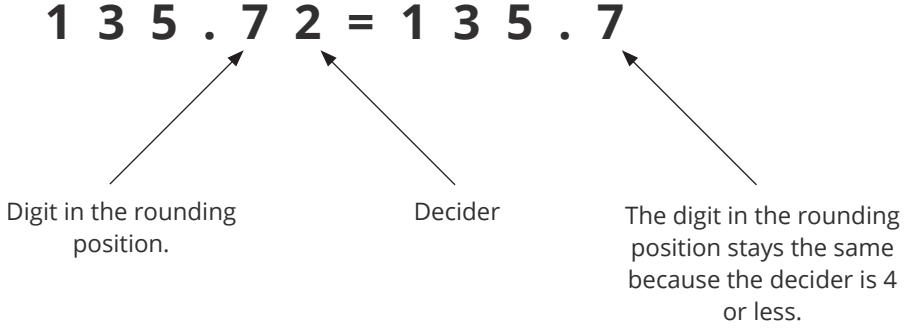
Let's look at this in practice.

Rounding to One Decimal Place

Write 135.72 correct to the nearest tenth.

1. Identify the digit in the rounding position. In this case, we are asked to write the number correct to the nearest tenth. Thinking about place values, the tenths column is the first column after the decimal point, so rounding to the nearest tenth is the same as rounding to one decimal place. In this question, the first digit after the decimal point is 7, therefore this is the digit in the rounding position.
2. To determine whether the number needs to be rounded up or down, we must look at the **decider**. This is the digit immediately to the right of the rounding position, in this case, a 2.
3. If the decider is 4 or less, we round the number down. If it is 5 or more, we round up. As the decider is 2 we are rounding down, the 7 in the rounding position remains the same.
4. Finally, any digits after the 7 are removed. Although the 7 hasn't changed, removing these digits means we have rounded down, as our new number is smaller than our original number.

137.72 correct to the nearest tenth is 137.7. We do not need any zeros after the 7 as that would change the number of decimal places.



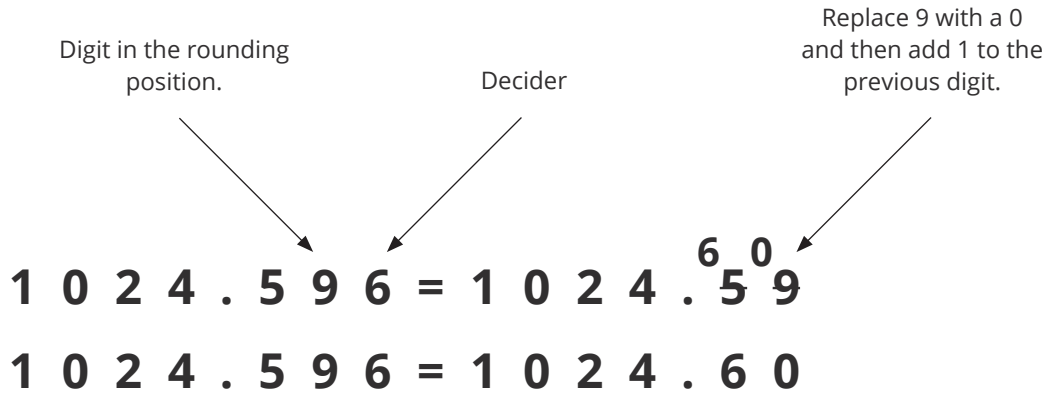
Rounding to Two Decimal Places

Write 1024.596 correct to 2 decimal places.

In this case we are told how many decimal places to round to, and we don't have to think about place values. To round to 2 decimal places, we follow similar steps to rounding to 1 decimal place.

1. Identify the digit in the rounding position. We are asked to write the number correct to 2 decimal places, so we find the second digit after the decimal point: 9
2. Find the decider immediately to the right of the rounding position: 6
3. As the decider is 5 or more, we need to round up. This means the number in the rounding position increases. However, we can't turn 9 into 10, it won't fit. Instead, we replace the 9 with 0 and add the 1 to the number to the left. In this example, that turns the 5 into a 6, leaving us with 1024.60... (in some cases, that number to the left will also be a 9. In that case, you replace that 9 with a 0, and add 1 to the next digit to the left).
4. As before, we remove all numbers after the rounding position, giving us 1024.60.

1024.596 correct to 2 decimal places is 1024.60



Rounding to Three Decimal Places

Write 0.0584 correct to 3 decimal places.

Once we know how to round to 1 or 2 decimal places, we can easily round to 3 decimal places.

1. Identify the digit in the rounding position: 8
2. Locate the decider digit: 4
3. Apply the rounding rules: 4 tells us that the digit in the rounding position remains the same.
4. Remove the numbers after the rounding position, as this means the number is rounded down.

0.0584 correct to 3 decimal places is 0.058

Your Turn

1. Write the following numbers correct to the nearest tenth.

a. 5.82 _____

b. 9.77 _____

c. 21.45 _____

d. 62.193 _____

e. 785.49 _____

f. 80.02 _____

g. 0.095 _____

h. 9.99 _____

2. Write the following numbers correct to 2 decimal places.

a. 7.854 _____

b. 5.146 _____

c. 16.0258 _____

d. 10.045 _____

e. 8.155 _____

f. 156.2879 _____

g. 1.989 _____

h. 0.0986 _____

3. Write the following numbers correct to 3 decimal places.

a. 0.0348 _____

b. 4.2266 _____

c. 1.84208 _____

d. 1058.9254 _____

e. 128.01756 _____

f. 40.48725 _____

g. 989.9994 _____

h. 0.09999 _____

4. Calculate 4.95 + 6.23

Round your answer to 1 decimal place.

_____

_____

5. Calculate 10.26 + 0.489

Round your answer to the nearest hundredth.

_____

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Challenge

a. Round 7.62cm to the nearest mm, leaving your answer in centimetres.

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b. Round 4.586m to the nearest cm, leaving your answer in metres.

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