

ROUNDING

Page	Description
1	Order decimals, Round to 1 and 2 decimal places. Round to nearest 100, 10, 1, 1 dp and 2 dp
2	Round to a given Significant Figure
3	Round to 1 and 2 Significant Figures. Obtain an approximate answer by rounding
4	Round to 1 Significant Figure. Obtain an approximate answer by rounding
5	Recap on significant figures and approximate answers

Decimals - Ordering, Rounding and Scales

Write these decimals in order of size, smallest to largest

1) 0.2 0.201 0.21 0.12 *0.12, 0.2, 0.201, 0.21*

2) 0.372 0.273 0.327 0.237 *0.237, 0.273, 0.327, 0.372*

Round these numbers to ONE DECIMAL PLACE

Question	Number	to 1 d.p.
example	12.47	12.5
3	0.87	0.9
4	1.082	1.1
5	0.91	0.9
6	5.98	6.0
7	10.129	10.1
8	1.99	2.0
9	125.38	125.4
10	1.2356	1.2

Round these numbers to TWO DECIMAL PLACES

Question	Number	to 2 d.p.
example	12.476	12.48
11	1.234	1.23
12	6.365	6.37
13	0.853	0.85
14	12.659	12.66
15	10.129	10.13
16	125.026	125.03
17	8.489	8.49
18	1.999	2.00

Round the number 456.283 to

19)	nearest hundred	500
20)	nearest ten	460
21)	nearest whole number	456
22)	1 decimal place	456.3
23)	2 decimal places	456.28

Rounding to a given number of significant figures

The first significant figure is the first non-zero figure in a number when moving from left to right. Once you have found the first significant figure, number the other significant figures, without gaps. You may need to use zeros to hold a number in its place value column.

Qu.1 35072

	3	5	0	7	2
to 1sf	4	0	0	0	0
to 2sf	3	5	0	0	0
to 3sf	3	5	1	0	0
to 4sf	3	5	0	7	0
to 5sf	3	5	0	7	2

Qu. 2 2.8378

	2	8	3	7	8
to 1sf	3				
to 2sf	2	8			
to 3sf	2	8	4		
to 4sf	2	8	3	8	
to 5sf	2	8	3	7	8

Qu. 3 0.0672

	0	0	6	7	2
to 1sf	0	0	7		
to 2sf	0	0	6	7	
to 3sf	0	0	6	7	2

Qu. 4 687.72

	6	9	7	7	2
to 1sf	7	0	0		
to 2sf	7	0	0		
to 3sf	6	9	8		
to 4sf	6	9	7	7	
to 5sf	6	9	7	7	2

Qu. 4 0.0080990

	0	0	0	8	0	9	9	0
to 1sf	0	0	0	8				
to 2sf	0	0	0	8	1			
to 3sf	0	0	0	8	1	0		
to 4sf	0	0	0	8	0	9	9	
to 5sf	0	0	0	8	0	9	9	0

Exercise 1 Round these numbers to 1 significant figure.

- 1) 45.4839 → 50
2) 3049 → 3000
3) 356 → 400
4) 0.0367 → 0.04
5) 2.09 → 2
6) 3.8947 → 4
7) 0.0786 → 0.08
8) 7896.5677 → 8000

Exercise 2 Round these numbers to 2 significant figures.

- 1) 45.4839 → 45
2) 3049 → 3000
3) 356 → 360
4) 0.0367 → 0.037
5) 2.09 → 2.1
6) 3.8947 → 3.9
7) 0.0786 → 0.079
8) 7896.5677 → 7900

Exercise 3 Round every number to 1 s.f. Then work out the answer to the sum. Remember order of operations.

- 1) 3.4×4.8
 $4 \times 5 = 20$
2) $45.36 + 38.2$
 $50 + 40 = 90$
3) $65.36 - 19.25$
 $70 - 20 = 50$
4) $41.238 \div 4.908$
 $40 \div 5 = 8$
5) $2.3 + 5.98 + 12.36$
 $2 + 6 + 10 = 18$
6) 3.25×2.14
 $3 \times 2 = 6$
7) 3.68×0.227
 $4 \times 0.2 = 0.8$
8) 28.85×47.9
 $30 \times 50 = 1500$
9) $2.43 + 3.56 \times 4.68$
 $2 + 4 \times 5$
 $= 2 + 20$
 $= 22$
10) 5.892^2
 $6^2 = 6 \times 6 = 36$

To get an **approximate answer** to a sum round each number to **1 significant figure** and then work out the answer.

$$3.45 \times 5.98 \text{ becomes } 3 \times 6 = 18$$

$$344 \times 67 \div 4.789 \text{ becomes } 300 \times 70 \div 5 = 21000 \div 5 = 4200$$

If a question involves a **square root**, round the square root to the nearest square number (1, 4, 9, 16, 25 ..)

$$3.78 \times \sqrt{26} \text{ becomes } 4 \times \sqrt{25} = 4 \times 5 = 20$$

Exercise 1 Round these numbers to 1 significant figure.

- | | | | |
|------------------|-----------------|-------------------|----------------------|
| 1) 45.4839
50 | 2) 3049
3000 | 3) 356
400 | 4) 0.0367
0.04 |
| 5) 2.09
2 | 6) 3.8947
4 | 7) 0.0786
0.08 | 8) 7896.5677
8000 |

Exercise 2 Work out an approximate answer to -

- | | |
|--|---|
| 1) 34.36×5.347
$30 \times 5 = 150$ | 2) $73.237 - 4.637 \times 7.8$
$70 - 5 \times 8$
$= 70 - 40$
$= 30$ |
| 3) $\sqrt{35} - \sqrt{17}$
$\sqrt{36} - \sqrt{16}$
$6 - 4 = 2$ | 4) $41.238 \div 4.908$
$40 \div 5 = 8$ |
| 5) $\frac{\sqrt{26} \times 1.84}{0.48}$
$\frac{\sqrt{25} \times 2}{0.5} = \frac{5 \times 2}{0.5} = \frac{10}{0.5} = 20$ | 6) 3.25×2.14
$3 \times 2 = 6$ |
| 7) 3.68×0.227
$4 \times 0.2 = 0.8$ | 8) 28.85×47.9
$30 \times 50 = 1500$ |
| 9) $\frac{34.67 \times 43.78}{5.98}$
$\frac{30 \times 40}{6} = \frac{1200}{6} = 200$ | 10) $\frac{0.623 \times 8.321}{2.9 \times 4.1}$
$\frac{0.6 \times 8}{3 \times 4} = \frac{4.8}{12} = 0.4$ |
- 11) Sara worked this out on her calculator $\frac{19.8 \times 3.9}{19.8 - 3.9}$, her calculator showed

3.258227848

Write down a calculation Sara could do in her head to check whether her answer is correct.

$$\frac{20 \times 4}{20 - 4} = \frac{80}{16} = 5$$

- 12) Estimate the answer to $\frac{1}{2} \times 78.2 \times (5.1)^2$

$$0.5 \times 80 \times 5^2 = 1000$$

OR $\frac{80}{20} = 4$

4

Round these numbers to 1 significant figure

- 1) 235 \rightarrow 200 2) 0.0056 \rightarrow 0.006
 3) 2.06 \rightarrow 2 4) 12.36 \rightarrow 10
 5) 256000 \rightarrow 300000 6) 1.99 \rightarrow 2
 7) 25.6 \rightarrow 30 8) 0.00098 \rightarrow 0.001

Round these numbers to 2 significant figures

- 9) 55686 \rightarrow 56000 10) 0.25687 \rightarrow 0.26
 11) 4002 \rightarrow 4000 12) 0.000999 \rightarrow 0.0010

Obtain approximate answers to these questions

$$5 \times 90 = 450$$

13) 5.36×89.235

14) $789 \div 42.365$

$$800 \div 40 = 20$$

15) $32.25 - 3.4 \times 5.2$
 $30 - 3 \times 5 = 30 - 15 = 15$

16) $\frac{53.26 + 29.255}{1.8965 + 6.23556}$

$$\frac{50 + 30}{2 + 6} = \frac{80}{8} = 10$$

17) $0.4896 \times \sqrt{63.25}$
 $0.5 \times \sqrt{64} = 0.5 \times 8 = 4$

18) $\sqrt{24.258} + \sqrt{80.25}$

$$\sqrt{25} + \sqrt{81} = 5 + 9 = 14$$

19) $\frac{0.965}{0.213 + 0.3058}$

20) 2.0356×23.56^2

$$2 \times 20^2 = 2 \times 400 = 800$$

$$\frac{1}{0.2 + 0.3} = \frac{1}{0.5} = 2$$

21) Sally is saving for a new car. She has saved £61.25 per week for 2 years. The car costs £6500. Write down an APPROXIMATE calculation she could do to see if she has saved enough money?

$$61.25 \times 52 \times 2$$

Would your calculation be an over or under estimate? $= 60 \times 50 \times 2$

Not quite enough money. It is an underestimate = £6000

22) John bought 4 items A, B, C and D at a shop.

Item	Unit Cost	Number bought	Total cost
A	2.56	17	$3 \times 20 = 60$
B	12.25	35	$10 \times 40 = 400$
C	89p	22	$0.9 \times 20 = 18$
D	130.25	2	$100 \times 2 = 200$

$$\pounds 678$$

By APPROXIMATING find the total cost of his shopping.

5