

Name _____

Date _____

3.2 Rounding — worked answers

Round numbers to a given number of decimal places or significant figures, and choose a sensible degree of accuracy. · 56 questions

A · Fluency — Round to decimal places and significant figures.

- 1 Round **4.27** to 1 decimal place.

Answer: 4.3

Look at the digit just after the 1 decimal place position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $4.27 \rightarrow 4.3$.

- 2 Round **8.53** to 1 decimal place.

Answer: 8.5

Look at the digit just after the 1 decimal place position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $8.53 \rightarrow 8.5$.

- 3 Round **12.96** to 1 decimal place.

Answer: 13

Look at the digit just after the 1 decimal place position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $12.96 \rightarrow 13$.

- 4 Round **0.48** to 1 decimal place.

Answer: 0.5

Look at the digit just after the 1 decimal place position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $0.48 \rightarrow 0.5$.

- 5 Round **7.05** to 1 decimal place.

Answer: 7.1

Look at the digit just after the 1 decimal place position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $7.05 \rightarrow 7.1$.

- 6 Round **19.99** to 1 decimal place.

Answer: 20

Look at the digit just after the 1 decimal place position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $19.99 \rightarrow 20$.

- 7 Round **3.146** to 2 decimal places.

Answer: 3.15

Look at the digit just after the 2 decimal places position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $3.146 \rightarrow 3.15$.

- 8 Round **0.0752** to 2 decimal places.

Answer: 0.08

Look at the digit just after the 2 decimal places position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $0.0752 \rightarrow 0.08$.

- 9 Round **6.895** to 2 decimal places.

Answer: 6.9

Look at the digit just after the 2 decimal places position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $6.895 \rightarrow 6.9$.

- 10 Round **14.203** to 2 decimal places.

Answer: 14.2

Look at the digit just after the 2 decimal places position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $14.203 \rightarrow 14.2$.

- 11 Round **2.675** to 2 decimal places.

Answer: 2.68

Look at the digit just after the 2 decimal places position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $2.675 \rightarrow 2.68$.

- 12 Round **9.999** to 2 decimal places.

Answer: 10

Look at the digit just after the 2 decimal places position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $9.999 \rightarrow 10$.

- 13 Round **5.4** to the nearest whole number.

Answer: 5

Look at the digit just after the units position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $5.4 \rightarrow 5$.

- 14 Round **8.5** to the nearest whole number.

Answer: 9

Look at the digit just after the units position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $8.5 \rightarrow 9$.

- 15 Round **149.5** to the nearest whole number.

Answer: 150

Look at the digit just after the units position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $149.5 \rightarrow 150$.

- 16 Round **0.62** to the nearest whole number.

Answer: 1

Look at the digit just after the units position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $0.62 \rightarrow 1$.

- 17 Round **23.49** to the nearest whole number.

Answer: 23

Look at the digit just after the units position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $23.49 \rightarrow 23$.

- 18 Round **99.7** to the nearest whole number.

Answer: 100

Look at the digit just after the units position. If it is 5 or more, round up; if it is less than 5, leave the digit alone. $99.7 \rightarrow 100$.

- 19 Round **45678** to 3 significant figures.

Answer: 45700

Count 3 digits from the first non-zero digit, then look at the next digit to decide whether to round up. $45678 \rightarrow 45700$.

- 20** Round **0.04567** to 2 significant figures.

Answer: 0.046

Count 2 digits from the first non-zero digit, then look at the next digit to decide whether to round up.
 $0.04567 \rightarrow 0.046$.

- 21** Round **2.349** to 2 significant figures.

Answer: 2.3

Count 2 digits from the first non-zero digit, then look at the next digit to decide whether to round up.
 $2.349 \rightarrow 2.3$.

- 22** Round **8721** to 2 significant figures.

Answer: 8700

Count 2 digits from the first non-zero digit, then look at the next digit to decide whether to round up.
 $8721 \rightarrow 8700$.

- 23** Round **0.006812** to 3 significant figures.

Answer: 0.00681

Count 3 digits from the first non-zero digit, then look at the next digit to decide whether to round up.
 $0.006812 \rightarrow 0.00681$.

- 24** Round **19850** to 3 significant figures.

Answer: 19900

Count 3 digits from the first non-zero digit, then look at the next digit to decide whether to round up.
 $19850 \rightarrow 19900$.

B · Reasoning — Which digit decides, and what could the original number have been.

- 25** What does “round to 2 decimal places” tell you?

- ☐ Keep 2 digits altogether
- ☐ Keep 2 digits after the decimal point
- ☐ Keep 2 digits before the decimal point
- ☐ Multiply by 100

Answer: Keep 2 digits after the decimal point

Decimal places are counted after the point, so $3.146 \rightarrow 3.15$.

- 26** When you round, which digit do you look at?

- ☐ The last digit of the number
- ☐ The digit in the rounding position
- ☐ The digit immediately to the right of the rounding position
- ☐ The first digit

Answer: The digit immediately to the right of the rounding position

That digit decides: 5 or more rounds up, less than 5 leaves it alone.

- 27** Does 7.45 round to 7.5 to 1 decimal place?

- ☐ Yes
- ☐ No

Answer: Yes

The digit after the tenths place is 5, so you round up: 7.5.

- 28** Does 7.44 round to 7.5 to 1 decimal place?

- ☐ Yes
☐ No

Answer: No

The digit after the tenths place is 4, which is less than 5, so it stays 7.4.

- 29** Round 9.999 to 2 decimal places.

Answer: 10

The third decimal is 9, so round up: $9.99 + 0.01 = 10.00$, written 10. Rounding can change every digit.

- 30** Round 19.99 to 1 decimal place.

Answer: 20

The second decimal is 9, so round up: 20.0, usually written 20.

- 31** A number rounds to 4.3 to 1 decimal place. Which of these could it be?

- ☐ 4.24
☐ 4.35
☐ 4.28
☐ 4.41

Answer: 4.28

Any number from 4.25 up to (but not including) 4.35 rounds to 4.3. 4.28 is in that range.

- 32** What is the smallest number that rounds to 8 to the nearest whole number?

Answer: 7.5

Anything from 7.5 up to just below 8.5 rounds to 8.

- 33** What is the largest whole number of tenths that rounds to 8 to the nearest whole number?
Give the decimal.

Answer: 8.4

8.4 rounds down to 8, but 8.5 rounds up to 9.

- 34** Why do we round?

- ☐ To make numbers wrong
☐ To give an answer to a sensible degree of accuracy
☐ To make numbers bigger
☐ Because calculators cannot show every digit

Answer: To give an answer to a sensible degree of accuracy

A measurement of 1.208571... metres is more precise than anyone needs; 1.21 m is a sensible degree of accuracy.

- 35** Work out $8.46 \div 7$ and give your answer to 2 decimal places.

Answer: 1.21

$8.46 \div 7 = 1.2085714...$, and the third decimal is 8, so round up to 1.21. Work out one decimal place more than you need, then round.

- 36** Work out $7.62 \div 5$ and give your answer to 1 decimal place.

Answer: 1.5

$7.62 \div 5 = 1.524$, and the second decimal is 2, so it stays 1.5.

C · Challenge — Boundaries, carrying and rounded divisions.

- 37** A number rounds to 6.7 to 1 decimal place. What is the smallest it could be?
Answer: 6.65
Anything from 6.65 up to just below 6.75 rounds to 6.7.
- 38** A number rounds to 250 to the nearest ten. What is the largest whole number it could be?
Answer: 254
254 rounds down to 250, but 255 rounds up to 260.
- 39** A number rounds to 5 to the nearest whole number and to 5.0 to 1 decimal place. What is the smallest it could be?
Answer: 4.95
To round to 5.0 to 1 d.p. it must be at least 4.95; that also rounds to 5.
- 40** Round 2.675 to 2 decimal places.
Answer: 2.68
The third decimal is 5, so round up: 2.68. (A calculator may show 2.67 because of how it stores 2.675 — trust the rule.)
- 41** Work out $9.428 \div 7$ to 2 decimal places.
Answer: 1.35
 $9.428 \div 7 = 1.3468\dots$, and the third decimal is 6, so round up to 1.35.
- 42** Work out $8.6 \div 13$ to 3 decimal places.
Answer: 0.662
 $8.6 \div 13 = 0.66153\dots$, and the fourth decimal is 5, so round up to 0.662.
- 43** Zara rounds 3.4999 to 1 decimal place by first rounding to 3 d.p., then 2 d.p., then 1 d.p. What answer does she get, and is it right?
☐ 3.5, and it is correct
☐ 3.5, but the method is wrong
☐ 3.4, and it is correct
☐ 3.4, but the method is wrong
Answer: 3.5, but the method is wrong
Rounding in stages gives $3.500 \rightarrow 3.50 \rightarrow 3.5$, but rounding 3.4999 directly to 1 d.p. gives 3.5 as well here. In general, rounding in stages is unsafe — always round once, from the original number.
- 44** The population of a town is 19 850. Round it to 3 significant figures.
Answer: 19900
The first three significant digits are 1, 9, 8; the next digit is 5, so round up: 19 900.

D · Word problems — Sensible accuracy in real measurements.

- 45** A shop bill comes to \$23.478. How much is paid, to the nearest cent (2 decimal places)? Give the number of dollars.
Answer: 23.48
The third decimal is 8, so round up: \$23.48.
- 46** A plank is 2.346 m long. Give its length to 1 decimal place, in metres.
Answer: 2.3
The second decimal is 4, so it stays 2.3 m.

- 47** A race time is 12.968 seconds. Give it to 2 decimal places.

Answer: 12.97

The third decimal is 8, so round up: 12.97 s.

- 48** A bag of apples weighs 1.4499 kg. Give the mass to 1 decimal place, in kg.

Answer: 1.4

The second decimal is 4, so it stays 1.4 kg.

- 49** Three friends share \$50 equally. How much does each get, to the nearest cent? Give the number of dollars.

Answer: 16.67

$50 \div 3 = 16.666\dots$, and the third decimal is 6, so round up to \$16.67.

- 50** A car travels 100 km on 7 litres of fuel. How many kilometres per litre, to 1 decimal place?

Answer: 14.3

$100 \div 7 = 14.2857\dots$, and the second decimal is 8, so round up to 14.3 km.

- 51** A field is 38.6 m by 24.3 m. Work out its area and give the answer to the nearest whole square metre.

Answer: 938

$38.6 \times 24.3 = 937.98$, which rounds to 938 m².

- 52** A rope 12 m long is cut into 7 equal pieces. How long is each piece, to 2 decimal places, in metres?

Answer: 1.71

$12 \div 7 = 1.7142\dots$, so 1.71 m.

- 53** A recipe needs 0.375 kg of flour per cake. How much for 4 cakes, to 1 decimal place, in kg?

Answer: 1.5

$0.375 \times 4 = 1.5$ kg exactly.

- 54** A phone costs \$499.99. Round it to the nearest hundred dollars.

Answer: 500

The tens digit is 9, so round up to \$500.

- 55** A journey takes 2.5 hours at 63 km/h. How far is it, to the nearest km?

Answer: 158

$63 \times 2.5 = 157.5$, which rounds up to 158 km.

- 56** A tank holds 8.46 litres. It is shared equally into 7 bottles. How much is in each bottle, to 2 decimal places, in litres?

Answer: 1.21

$8.46 \div 7 = 1.2085\dots$, so 1.21 litres.