Decimals — ordering and rounding

- Reading decimals on a number line
- Comparing decimals
- Multipling and dividing decimals by 10, 100 and 1000
- Rounding whole numbers and decimals

Keywords

You should know

explanation 1a explanation 1b online

1 Write the value of each underlined digit as a fraction.

a 2.7̲65 **b** 0.91̲4 **c** 12.3̲8 **d** 36.9̲5

2 Write the value of each underlined digit in words.

a 7.2̲1 **b** 0.2̲87 **c** 124.3̲8 **d** 0.00̲4

3 Write these numbers in words.

a $\frac{3}{10}$ **b** $\frac{7}{100}$ **c** $\frac{41}{1000}$ **d** $\frac{38}{100}$

4 Write these numbers as decimals.

a Four and seven hundredths

b Twelve and three tenths

c Sixteen and five thousandths

d Thirty-two and twenty-seven thousandths

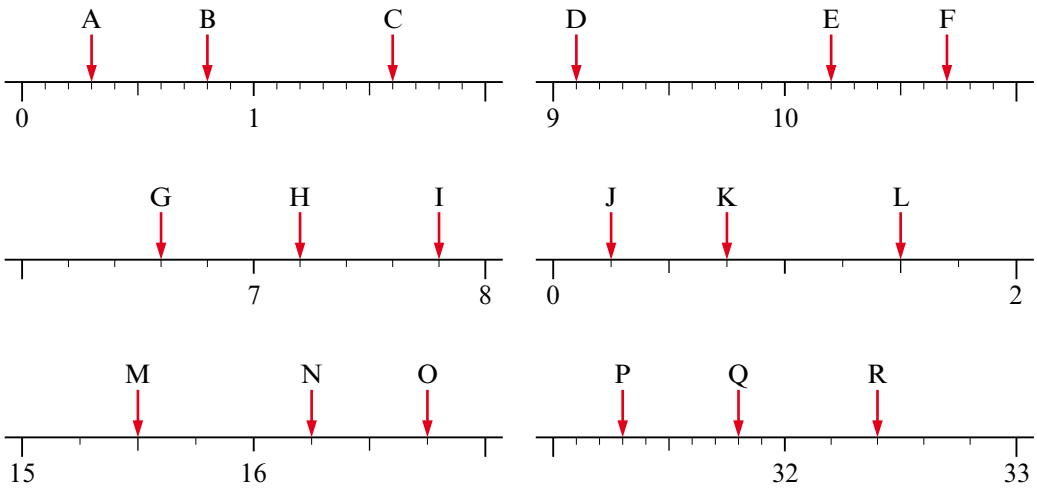
5 Write each of these as a decimal number.

a $5 + \frac{3}{10}$ **b** $23 + \frac{9}{100}$ **c** $2 + \frac{8}{10} + \frac{2}{100}$

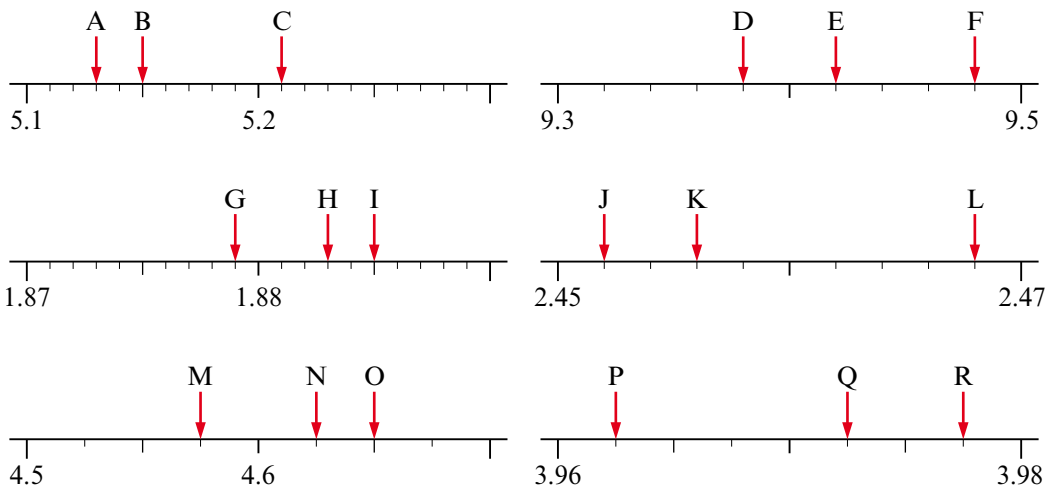
d $1 + \frac{3}{10} + \frac{8}{1000}$ **e** $9 + \frac{25}{100}$ **f** $1 + \frac{73}{1000}$

g $34 + \frac{683}{1000}$ **h** $1 + \frac{1}{1000}$ **i** $3 + \frac{1}{100} + \frac{3}{1000}$

6 Here are some number lines. Write down the value at each of the labelled points.



7 Here are some number lines. Write down the value at each of the labelled points.



8 Find the decimal that is halfway between the numbers in each pair.

a 3.6, 3.7 **b** 2.1, 2.2 **c** 3.9, 4 **d** 0, 0.1

e 7.6, 8 **f** 5.36, 5.37 **g** 8.98, 9 **h** 0, 0.01

explanation 2 online

9 Work out these calculations.

a 2.71 × 10 **b** 3.6 ÷ 10 **c** 0.209 × 10 **d** 0.045 × 10

e 0.37 ÷ 10 **f** 2.8 × 10 **g** 37 ÷ 10 **h** 673 ÷ 10

10 Work out these calculations.

a 1.2×100 **b** 3.42×100 **c** $67 \div 100$ **d** 100×0.57

e $3.28 \div 100$ **f** $0.27 \div 100$ **g** 0.0286×100 **h** $239 \div 100$

11 Work out these calculations.

a 0.18×1000 **b** $8 \div 1000$ **c** $2.01 \div 1000$ **d** 0.025×1000

e $0.76 \div 1000$ **f** $400 \div 1000$ **g** $6781 \div 1000$ **h** 1000×0.006

12 A car on a motorway travels 27.8 m every second. Work out how far it travels in:

a 10 seconds **b** 1 minute 40 seconds

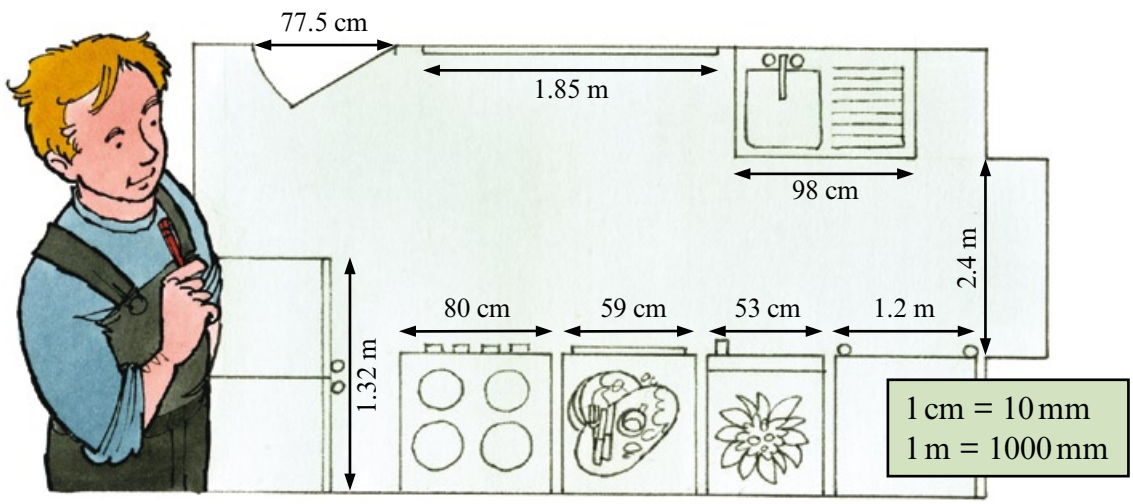
13 Diesel costs 99.7 p per litre. A truck driver pays for 1000 litres.

a What is the cost in pence? **b** What is the cost in pounds?

14 A pack of 100 biros weighs 950 g. How much does each biro weigh?

15 Bob is fitting a new kitchen. He wants all of the measurements to be in millimetres.

Write each of the labelled measurements in millimetres.



16 Find the value of the missing numbers.

a $\square \times 0.003 = 0.03$ **b** $2.7 \div \square = 0.0027$ **c** $100 \times \square = 45$

d $\square \div 1000 = 0.653$ **e** $10 \times \square = 0.09$ **f** $\square \div 10 = 8.6$

g $4.2 \times \square = 4200$ **h** $\square \div 100 = 1.6$ **i** $0.281 \div \square = 0.0281$

17 Copy and complete these conversions.

a 37.5 cm = ☐ mm **b** 495 mm = ☐ cm **c** 786 mm = ☐ m

d 127 cm = ☐ m **e** 1230 mm = ☐ m **f** 3.2 m = ☐ mm

18 Convert these volumes.

1 litre = 1000 ml
1 litre = 100 cl

a 3 litres to centilitres **b** 270 cl to litres

c 700 ml to centilitres **d** 1200 ml to litres

e 320 cl to millilitres **f** 0.85 litres to centilitres

19 A standard wine bottle has a capacity of 75 cl. A magnum contains 1.5 litres and a jeroboam contains 3000 ml.

a How many standard bottles are equivalent to a magnum?

b How many standard bottles are equivalent to a jeroboam?

explanation 3 online

20 Write these numbers in order of size, starting with the smallest.

a 6, 5.9, 5.849, 5.85, 5.4999 **b** 11.3, 11.56, 11.18, 11.29, 11.06

c 0.278, 0.25, 0.3, 0.249, 0.28 **d** 7.127, 7.123, 7.12, 7.129, 7.192

e 0.0738, 0.0729, 0.073, 0.0732 **f** 19.1, 19.09, 19.18, 19.099, 19.178

21 Write down the smallest of each of these sets of numbers as a decimal.

a $\frac{7}{10}, \frac{19}{100}, 0.24, \frac{38}{100}, 0.275$ **b** $\frac{3}{10} + \frac{7}{100}, 0.41, \frac{3}{10} + \frac{9}{1000}, 0.39$

c $\frac{9}{100} + \frac{8}{1000}, 0.092, 0.1, 0.099$ **d** $\frac{27}{100}, \frac{138}{1000}, \frac{3}{10}, 0.14, 0.139$

22 Copy and complete. Use < or >.

The first one has been done for you.

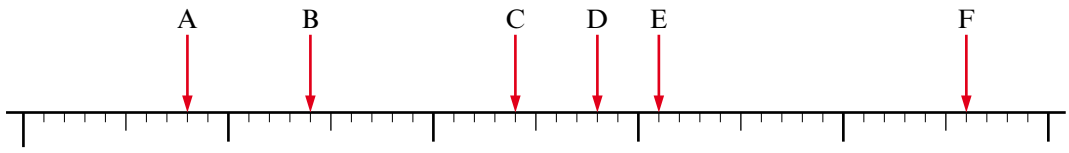
a $2.79 < 2.8$ **b** $0.18 \square 0.179$ **c** $2.409 \square 2.413$

d $12.23 \square 12.229$ **e** $32.001 \square 32.01$ **f** $26.047 \square 26.0467$

g $\frac{37}{100} \square \frac{268}{1000}$ **h** $\frac{27}{100} \square \frac{89}{1000}$ **i** $\frac{1}{10} \square \frac{99}{1000}$

23 Match the following numbers to the labelled points on the number line.

2.798, 2.801, 2.778, 2.794, 2.816, 2.784

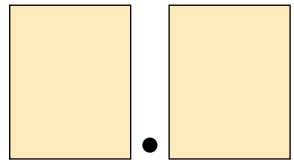


24 Copy and complete. Use < or >.

a 27 mm ☐ 2.5 cm **b** 9.8 cm ☐ 9.7 m **c** 240 cm ☐ 0.25 m

d 0.8 m ☐ 760 mm **e** 58.2 cm ☐ 590 mm **f** 3020 mm ☐ 3.1 m

25 Here are two digit cards separated by a decimal point.



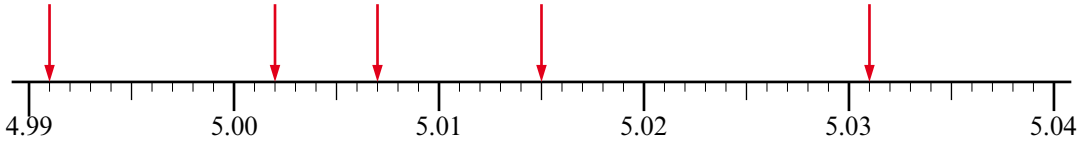
Use any two of the digits from 9, 8, 7 and 2 to make a number. You can only use each digit once in any number that you make.

Make a list of all the possible numbers in order of size, largest first.

26 Each of the following clues refers to a number shown by an arrow on the number line below. Find the value of each letter.

a $a > 5.03$ **b** $b > 5$ and $b < 5.005$ **c** $c < 5$

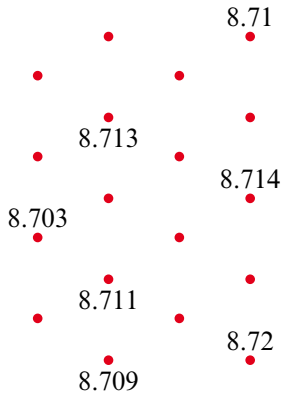
d $5.01 < d < 5.02$ **e** $5.002 < e < 5.015$



27 Copy the diagram.

Join the four smallest values in order. Make a closed shape by joining to the smallest value again.

If you are right, the diagram should let you know! Explain.

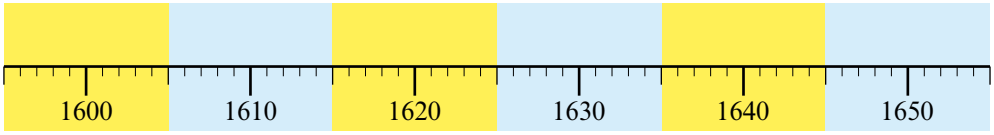


explanation 4 — online

28 **a** Use the diagram to help you round each of these numbers to the nearest 10.

i 1623 **ii** 1639 **iii** 1644 **iv** 1602

v 1654 **vi** 1605 **vii** 1597 **viii** 1635



b Write the numbers where each of the yellow and blue regions meet.

c The number x is 1620 to the nearest 10. What colour is the region containing x?

d Copy and complete. $\square \leq x < \square$

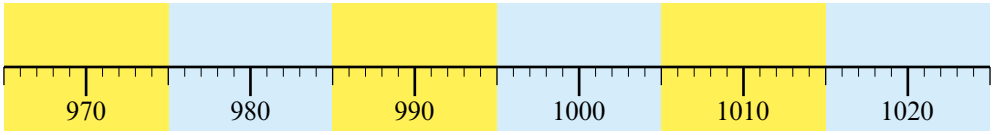
e The number y is 1650 to the nearest 10. Copy and complete. $\square \leq y < \square$

≤ means 'is less than or equal to'.

29 **a** Use the diagram to help you round each of these numbers to the nearest 10.

i 1014 **ii** 986 **iii** 975 **iv** 992

v 998 **vi** 1005 **vii** 1024 **viii** 969



b The number x is 1010 to the nearest 10. Copy and complete. $\square \leq x < \square$

c The number y is 980 to the nearest 10. Copy and complete. $\square \leq y < \square$

30 Strawberry pickers are paid at the end of each day. Sam likes to keep his accounts simple, so he pays everyone to the nearest £10 on what they earn.

a Work out how much Sam pays to each picker.

i Rob earns £37

ii Tara earns £63

iii Phil earns £54

iv Ravi earns £78

v Fran earns £74.50

vi Kate earns £65

vii Jack earns £57.41

viii Salma earns £82.29

ix Tim earns £59.78

b How much more did Fran need to earn to be paid an extra £10?

c Sam pays James £60.

i What is the least amount that James might have earned?

ii What is the greatest amount that James might have earned?

31 Round each of these numbers to the nearest 100.

a 479	**b** 548	**c** 839.2	**d** 451.8
e 67.5	**f** 41	**g** 80.27	**h** 149.3
i 1783	**j** 4709	**k** 21 386	**l** 17 449

32 Here are the attendance figures for the first game in a football season. Round each to the nearest thousand.

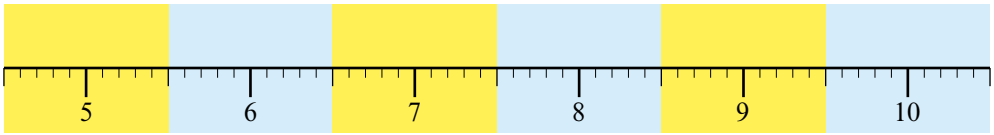
a Real Madrid 64 867	**b** Le Mans 32 131	**c** Hamburg 49 713
d Millwall 10 012	**e** Luton Town 8131	**e** Stoke City 8971

explanation 5 online

33 Use the diagram to help you round these decimals to the nearest whole number.

a 9.4 **b** 7.7 **c** 5.5 **d** 7.48

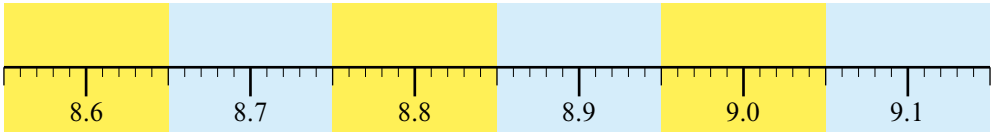
e 9.75 **f** 8.51 **g** 10.47 **h** 6.6002



34 Use the diagram to help you round these decimals to one decimal place.

a 8.93 **b** 8.66 **c** 9.04 **d** 8.74

e 8.75 **f** 9.048 **g** 8.863 **h** 9.119



35 Round each of these amounts to the nearest pound.

a £8.47 **b** £3.52 **c** £12.70 **d** £19.73

e £37.56 **f** £11.11 **g** £96.45 **h** £87.50

36 **a** What is the least amount that would round to £20 to the nearest pound?

b What is the greatest amount that would round to £20 to the nearest pound?

c What is the least amount that would round to £20 to the nearest £10?

d What is the greatest amount that would round to £20 to the nearest £10?

37 Fred is baffled. He is trying to place a stack of 10 boxes into the back of his van.

He knows that each box is 15 cm high, to the nearest centimetre. He also knows that the gap between the floor and the roof of his van is 1.5 m to the nearest 0.1 m.

The problem is that the boxes won't fit!

Explain why this might be.