Answers

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Number

Integers, decimals and symbols

1 **a** 200.1 **b** 2.001 **c** 2.3 **d** 87
2 **a** 140.94 **b** 1.4094 **c** 290 **d** 4.86
3 $-0.5, 0, 0.012, 0.12, 12$
4 **a** $\frac{5}{0.5} = 10$ **b** $1\frac{5}{9} > \frac{4}{3}$ **c** $-3 < -1$
5 **a** 5 **c** -15 **e** -4
   b -8 **d** 6

Addition, subtraction, multiplication and division

1 **a** 1561 **c** 69.93
   b 3047 **d** 23.923
2 **a** 2819 **c** 8.185
   b 287 **d** 5.401
3 **a** 29798 **b** 29.26 **c** 40.768
4 **a** 46 **b** 343 **c** 35.4

Using fractions

1 **a** $\frac{16}{5} = 3\frac{1}{5}$ **c** $\frac{5}{8}, \frac{3}{4}, \frac{9}{10}, 1\frac{1}{5}, \frac{16}{5}$
   b $1\frac{1}{5} = \frac{6}{5}$ **d** $4\frac{2}{5}$ **e** $2\frac{23}{40}$
2 $\frac{15}{45}, \frac{4}{12}, \frac{16}{48}$
3 **a** $7\frac{1}{3}$ **b** $3\frac{1}{2}$
4 $\frac{13}{60}$

Different types of number

1 **a** 16 **b** 5 **c** 16
2 $2 \times 2 \times 3 \times 5 \times 5$
3 every 144 days
4 **a** $2^2 \times 3^3 \times 7$ **b** 36

Listing strategies

1 12 **2** 180

The order of operations in calculations

1 **a** 18 **b** 13 **c** 25
2 **a** 10 **b** 23 **c** ± 5

Indices

1 **a** 7^{10} **b** 3^{-6} **c** 5^{20}
2 **a** 5^7 **c** $2^{10} \times 5^{-3}$
   b 6^{-3} **d** $7^{10} \times 11^{-1}$
3 **a** 1 **c** 16 **e** 18
   b 10 **d** $\frac{1}{5}$ (or 0.2)
4 $x = 1$

Surds

1 **a** $\sqrt{6}$ **b** 5 **c** 18 **d** 20
2 $a = 2$
3 **a** $3\sqrt{5}$ **b** $6\sqrt{2}$
4 **a** $\frac{16}{3\sqrt{2}} = \frac{16\sqrt{2}}{3\sqrt{2}\sqrt{2}} = \frac{16\sqrt{2}}{3 \times 2} = \frac{8\sqrt{2}}{3}$ **b** $8 - 2\sqrt{7}$
5 **a** -4 **b** $7 + 4\sqrt{3}$ **c** $5 + 3\sqrt{3}$

Standard form

1 **a** 0.005 **b** 565000
2 **a** 2.5×10^4 **c** 5×10^2
   b 1.25×10^{-3} **d** 1.4×10^{-2}
3 **a** 9×10^{-4} **c** 2×10^2
   b 2.4×10^3 **d** 8.04×10^4
4 **a** 1.33×10^{10} pounds
   b 26600000 people
5 **a** 1.55×10^4 **c** 5×10^2
   b 655000 **d** 4×10^3

Converting between fractions and decimals

1 **a** 0.43 **b** 0.375 **c** 0.55
2 **a** $\frac{4}{5}$ **b** $\frac{9}{20}$ **c** $\frac{73}{125}$
3 **a** $\frac{7}{9}$ **b** $\frac{2}{45}$ **c** $\frac{21}{22}$
4 **a** $\frac{14}{27}$ **b** $\frac{19}{25}$
5 Let $x = 0.7777777\ldots$
   $10x = 7.7777777\ldots$
   $10x - x = 7$
   $9x = 7$
   $x = \frac{7}{9}$
   Therefore, $0.77777\ldots + \frac{2}{9} = \frac{7}{9} + \frac{2}{9} = 1$
6 $-0.9, \frac{7}{10}, \frac{4}{5}, 0.85, \frac{7}{8}$

Converting between fractions and percentages

1 **a** $\frac{1}{4}$ **b** $\frac{17}{20}$ **c** $\frac{17}{25}$
2 maths: 81.25%
   Charlie did better at maths.
3 **a** 30% **b** 16% **c** 42.9%

Fractions and percentages as operators

1 **a** £480 **b** £4.50 **c** 156kg
2 School A: 336, School B: 455

Standard measurement units

1 **a** 9700g **b** 0.85 litres **c** 205000cm
2 8.64×10^4 seconds
3 £81.60