

- 1 a** Using a calculator, evaluate $5\sqrt{2.43 \times 10^7}$.
- b** Using a calculator, evaluate $10^{\frac{4}{3}}$. Give your answer to 1 decimal place.
- 2** Without using a calculator, work out
- a** $8 - 3 \div 2$
- b** $(-1)^3 + 32 \div 8 + 1$
- c** $\frac{27}{\frac{1}{3}}$ **d** 1.65×3.6
- 3** Without using a calculator, simplify the following fractions, giving your answers as mixed numbers in their simplest form.
- a** $\frac{64}{12}$ **b** $\frac{124}{13}$
- 4** Write the numbers 2, 3 and 4 in the boxes to give the largest possible total. Each number can only be used once.
- $$\square \frac{\square}{4} + \frac{1}{\square}$$
- 5** A rectangle has a length of 2.23 cm and a width of 4.55 cm, both to the nearest 0.01 cm.
- a** Work out the lower and upper bounds for the area of the rectangle in cm^2 to 3 decimal places.
- b** Give the area of the rectangle to a suitable degree of accuracy.
- 6** In 18 g of water there are 6.02×10^{23} molecules.
- a** How many molecules would there be in 10 g of water? Give your answer in standard form to 3 significant figures.
- b** Find the mass in kg of one molecule of water. Give your answer in standard form to 3 significant figures.
- 7** Work out an estimate for $(0.45 \times 0.78)^2$.
- 8** Find the value (as an integer or fraction) of
- a** 7^0 **b** $9^{\frac{1}{2}}$ **c** 8^{-2} **d** $64^{-\frac{1}{3}}$
- 9** Dylan rounds a number y to one decimal place. On rounding the number, the result is 5.6. Write down the error interval for y .
- 10** Show that the expression $\frac{1 - \sqrt{2}}{1 + \sqrt{2}}$ simplifies to $2\sqrt{2} - 3$.
- 11** The width of a sheet of glass, a , is 112 cm correct to 3 significant figures. Write down the error interval a .
- 12** Write the recurring decimal $0.\dot{7}\dot{2}$ as a fraction in its simplest form.
- 13** $c = \frac{a}{b}$
 $a = 0.6754$ correct to 4 significant figures
 $b = 2.34$ correct to 3 significant figures
- a** Work out the upper and lower bounds for a and b and hence work out the error interval for c . Give a reason for your answer.
- b** Give a value for c to a suitable degree of accuracy.
- 14** Work out each of the following. Simplify your answer where possible.
- a** $\frac{3}{25} \div \frac{9}{50}$ **b** $25 \div \frac{5}{16}$
- 15** Write each of the following numbers in standard form:
- a** 0.00000045 **c** 5640
- b** 12 million
- 16** Without using a calculator, work out the value of $(8 \times 10^{-5}) \times (4 \times 10^3)$ giving your answer in standard form.
- 17** **a** Write down all the factors of 64.
- b** Find the highest common factor of 64 and 100.