11 MySummary

Check out

You should now be able to ...

Test it

Questions

✓ Find square roots.	6	1
✓ Find cube roots.	6	2
✓ Use the rules of indices.	7	3
✓ Simplify surds.	8	4 – 8
✓ Convert to and from standard index form.	7	9 – 10

Language

Language	Meaning	Example
Square root	The square root of any number is the number which, when multiplied by itself, gives the starting number.	The square root of 81 is 9 because 9×9 is 81.
Cube root	The cube root of any number is the number which, when multiplied by itself and then multiplied by itself again, gives the starting number.	The cube root of 27 is 3 because $3 \times 3 \times 3$ is 27.
Index / power	The index or power tells you how many times to multiply a number by itself.	In 4^3, the index or power is 3. This represents $4 \times 4 \times 4$.
Surds	A root that cannot be written as a fraction, or as a terminating or recurring decimal.	$\sqrt{2}$ is in surd form – the decimal value cannot be given completely.
Standard index form	A short way of writing very large or very small numbers. A standard index form number is a number between 1 and 10 multiplied by a power of 10: $A \times 10^n$	42000 can be written as 4.2×10^4 in standard form. 0.00042 can be written as 4.2×10^{-4} in standard form.

11 MyReview

1 Use prime factors to find these square roots.

a $\sqrt{576}$ **b** $\sqrt{1225}$

2 Use trial and improvement to find these roots to 1 dp.

a $\sqrt{700}$ **b** $\sqrt[3]{200}$

3 Simplify these expressions, using indices in your answers.

a $a \times a \times 3$

b $b \times 2 \times b \times 3 \times c \times c \times b$

c $d^2 \times 4 \times d^3 \times d$

d $e^4 \times e^6 \times f^2 \times f$

e $g^3h^2 \times h^4g$

f $\frac{j^6}{j^5}$

g $\frac{j^4k^7}{j^2k}$

h $(m^2)^4$

i $(n^3p^2)^5$

j $\frac{4q^3 \times 7q^6}{14q^4}$

k $\frac{8(sr^3)^2}{2r^4s}$

4 Calculate the following.

a $\sqrt{5} \times \sqrt{5}$ **b** $\sqrt{9} \times \sqrt{4}$

c $\sqrt{6} \times \sqrt{24}$ **d** $\sqrt{8} \times \sqrt{50}$

5 Write these numbers in their simplest form.

a $\sqrt{28}$ **b** $\sqrt{72}$

c $\sqrt{125}$ **d** $\sqrt{363}$

6 Calculate the following leaving your answers in surd form.

a $\sqrt{3} \times \sqrt{6}$ **b** $2\sqrt{5} \times \sqrt{3}$

c $3\sqrt{7} \times 2\sqrt{21}$ **d** $5\sqrt{2} \times 3\sqrt{24}$

7 Write these numbers using index notation.

a $\sqrt{3}$ **b** $\sqrt[3]{4}$

c $\sqrt{7}$ **d** $\sqrt[3]{10}$

8 Work out the value of each of these expressions.

a $25^{\frac{1}{2}}$ **b** $1000^{\frac{1}{3}}$

c $121^{\frac{1}{2}}$ **d** $64^{\frac{1}{3}}$

9 Write each of the numbers out in full.

a 8.2×10^7 **b** 5.42×10^3

c 3.1×10^{-4} **d** 6.09×10^{-6}

10 Write each number in standard form.

a 5600 **b** 873000

c 0.062 **d** 0.000107

e 24.5×10^5 **f** 0.42×10^{-1}

What next?

Score	
0 – 4	Your knowledge of this topic is still developing. To improve look at Formative test: 3B-11; MyMaths: 1033, 1049, 1050, 1051, 1053, 1057 and 1064
5 – 8	You are gaining a secure knowledge of this topic. To improve look at InvisiPen: 181, 182, 183, 184, 185, and 186
9, 10	You have mastered this topic. Well done, you are ready to progress!