Some of the key points to learn

1. Squared numbers	4 – base 2 – power (index or exponent) $4^2 = 4 \times 4 = 16$ You must be able to recall all squared numbers up to 12 squared (144).
2. Cubed numbers	4 – base 3 – power (index or exponent) $4^3 = 4 \times 4 \times 4 = 64$
3. Square Roots	The square root of a number must equal that number when multiplied by itself. $\sqrt{16} = 4$ This is because 4 x 4 = 16
4. Surds	Surds are irrational numbers left in their root form. For example $\sqrt{17} = 4.12310562562$ therefore it is an irrational number.
5. Multiplying Surds	$\sqrt{8} \times \sqrt{10} = \sqrt{80} = \sqrt{16} \times \sqrt{5} = 4\sqrt{5}$ Remember to simplify your answers.
6. Dividing Surds	$\sqrt{20} \times \sqrt{5} = \sqrt{4} = 2$ Remember to simplify your answers.
7. Adding and Subtracting Surds	$\sqrt{8} + \sqrt{18}$ Both surds must be in their simplest form. $\sqrt{8} = 2\sqrt{2}$ $\sqrt{18} = 3\sqrt{2}$ $2\sqrt{2} + 3\sqrt{2} = 5\sqrt{2}$
8. Index Laws for multiplying /dividing	$a^3 \times a^3 = a^6$ add the indices $\frac{a^7}{a^3} = a^4$ subtract the indices

Some of the key points to learn

9. Index laws for brackets	Multiply the powers together $(a^3)^4 = a^{12}$
10. Fractional index laws	The denominator of the fraction is the root of the number or letter, and the numerator of the fraction is the power to raise the answer to. $8^{\frac{2}{3}} = (\sqrt[3]{8})^2 = 4$
11. Multiplication in standard form	$3.5 \times 10^4 \times 2 \times 10^5 =$ $(3.5 \times 2) \times 10^{(4+5)} =$ 7×10^9
12. Addition and subtraction in standard form	$(3 \times 10^4) + (5 \times 10^6)$ Addition and subtraction are easier as "normal numbers". $3 \times 10^4 = 30000$ $5 \times 10^6 = 5000000$ We have 5030000 which isn't in standard form. Answer: 5.03×10^6
13. nth term of a linear sequence	nth term rule is an + b The difference between the consecutive terms is a, the first term is always a + b.
14. nth term of a quadratic sequence	$a = \frac{\text{Second difference}}{2}$ b = The difference of each (Term - an^2) 1st term = $a + b + c$ Once you have found a, b and c you can slot these figures in the following formula. $an^2 + bn + c$

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Content

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- Understand the meaning of higher powers and know how to find these, and corresponding roots, using a calculator when necessary.
- Understand the difference between decimal approximation and exact values of roots.
- Derive, understand and use the rules of indices with integer values.
- Be able to perform calculations involving standard form, with and without a calculator as appropriate.
- Recognise and describe arithmetic and geometric sequences.
- Generate terms of a sequence given a rule
- Find a formula for the nth term of a linear and quadratic sequence.

Useful links

Index Laws Hegarty clips: 102 to 110
Surds Hegarty clips: 112 to 119
nth term (linear) Hegarty clips: 198
nth term (quadratic) Hegarty clips: 248 to 250

www.corbettmaths.com

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