	S3 Revision – Simplifying surds	
1	Express $\sqrt{18} - \sqrt{2}$ as a surd in its simplest form	2
2	Express $\sqrt{44} + 3\sqrt{11}$ as a surd in its simplest form	2
3	Simplify $\dfrac{\sqrt{12}}{\sqrt{3}}$	2
4	Simplify $\sqrt{3} \times \sqrt{27}$	2
5	Express $\sqrt{2}(\sqrt{3} + \sqrt{2}) + \sqrt{6}$ in the simplest form	2
6	Express $\dfrac{6}{\sqrt{3}}$ with a rational denominator in the simplest form	2
	12 marks	

	S3 Revision – Using the laws of indices	
7	Express $4a^5 \times \dfrac{1}{2}a^3$ in its simplest form	2
8	Simplify $5b^{10} \times 4b^{-3}$	2
9	Simplify $n^4 \times n^{-7}$ Give your answer with a positive power	2
10	Express $c^5(c^3 - c)$ in its simplest form	2
11	Simplify $6x^7 \div 2x^3$	2
12	Simplify $\dfrac{10a^8 \times a^3}{2a^7}$	3
13	Remove the brackets and simplify $(p^5)^2$	1
14	Remove the brackets and simplify $(6c^4)^2$	2
15	(a) Express $\sqrt{x}$ in index form (b) hence evaluate $25^{\frac{1}{2}}$	1 1
	18 marks	

	Answers			
1	Mark 1	know how to simplify $\sqrt{18}$	$\sqrt{18} = \sqrt{9}\sqrt{2} = 3\sqrt{2}$	2
	Mark 2	give your answer in the simplest form	$3\sqrt{2} - \sqrt{2} = \mathbf{2\sqrt{2}}$	
2	Mark 1	know how to simplify $\sqrt{45}$	$\sqrt{44} = \sqrt{4}\sqrt{11} = 2\sqrt{11}$	2
	Mark 2	give your answer in the simplest form	$2\sqrt{11} + 3\sqrt{11} = \mathbf{5\sqrt{11}}$	
3	Mark 1	know how to simplify $\sqrt{12}$	$\sqrt{12} = \sqrt{4}\sqrt{3} = 2\sqrt{3}$	2
	Mark 2	divide by $\sqrt{3}$	$\frac{2\sqrt{3}}{\sqrt{3}} = \mathbf{2}$	
	OR			
	Mark 1	divide $\sqrt{12}$ by $\sqrt{3}$	$\sqrt{\frac{12}{3}} = \sqrt{4}$	
	Mark 2	give your answer in the simplest form	$\sqrt{4} = \mathbf{2}$	
4	Mark 1	know how to simplify $\sqrt{27}$	$\sqrt{27} = \sqrt{9}\sqrt{3} = 3\sqrt{3}$	2
	Mark 2	multiply by $\sqrt{3}$	$3\sqrt{3} \times \sqrt{3} = 3 \times 3 = \mathbf{9}$	
	OR			
	Mark 1	multiply $\sqrt{3}$ by $\sqrt{27}$	$\sqrt{3 \times 27} = \sqrt{81}$	
	Mark 2	give your answer in the simplest form	$\sqrt{81} = \mathbf{9}$	
5	Mark 1	Multiply out the bracket	$\sqrt{2}\sqrt{3} + \sqrt{2}\sqrt{2} = \sqrt{6} + \sqrt{4}$	2
	Mark 2	give your answer in the simplest form	$\sqrt{6} + \sqrt{4} + \sqrt{6} = \mathbf{2\sqrt{6} + 2}$	
6	Mark 1	multiply by $\frac{\sqrt{3}}{\sqrt{3}}$ to give a fraction with rational denominator	$\frac{6}{\sqrt{3}} \times \frac{\sqrt{3}}{\sqrt{3}} = \frac{6\sqrt{3}}{3}$	2
	Mark 2	simplify the fraction	$\frac{6\sqrt{3}}{3} = \mathbf{2\sqrt{3}}$	
7	Mark 1	simplify powers	$4 \times \frac{1}{2} \times a^8$	2
	Mark 2	simplify the constants (the numbers)	$\mathbf{2a^8}$	
	One mark will be given for $8a^8 \ or \ 2a^{15},$ no marks will be given for $8a^{15}$			
8	Mark 1	simplify powers	$5 \times 4 \times b^7$	2
	Mark 2	simplify the constants (the numbers)	$\mathbf{20b^7}$	
	One mark will be given for $20b^{-30}$			

9	Mark 1	simplify powers	n^{-3}	2
	Mark 2	give your answer with a positive power	$\dfrac{1}{n^3}$	
	One mark will be given for $n^{-28} = \dfrac{1}{n^{28}}$			
10	Mark 1	multiply out the bracket	$c^5 \times c^3 - c^5 \times c^1$	
	Mark 2	simplify the powers	$\boldsymbol{c^8 - c^6}$	
	One mark will be taken off for a final answer of $c^8 - c^6 = c^2$			
11	Mark 1	simplify powers	$6x^4 \div 2$	2
	Mark 2	simplify the constants (the numbers)	$\boldsymbol{3x^4}$	
	One mark will be given for $3x^{10}$			
12	Mark 1	simplify powers on the numerator	$\dfrac{10a^{11}}{2a^7}$	2
	Mark 2	simplify the powers completely	$\dfrac{10a^4}{2}$	
	Mark 3	simplify the constants	$\boldsymbol{5a^4}$	
	Full marks are given for applying laws of indices in a different order $$\frac{5a^8 \times a^3}{a^7} = 5a^1 \times a^3 = 5a^4$$			
13	Mark 1	simplify powers	p^{10}	1
14	Mark 1	simplify powers	c^8	2
	Mark 2	square the constant	$\boldsymbol{36c^8}$	
	One mark will be given for $6c^8 \ \ or \ \ 36c^6$			
15	Mark 1	know that this is a fractional index	$x^{\frac{1}{2}}$	2
	Mark 2	use the answer from (a)	$25^{\frac{1}{2}} = \sqrt{25} = \boldsymbol{5}$	