AQA Level 2 Further Mathematics Number & Algebra I

Section 3: Surds

Exercise

1. Write these in terms of the simplest possible surd.

(i)	$\sqrt{8}$	(ii)	$\sqrt{50}$	(iii)	$\sqrt{48}$
(iv)	$\sqrt{216}$	(v)	$\sqrt{63}$	(vi)	$\sqrt{300}$
(vii)	$\sqrt{6}\times\sqrt{27}$	(viii)	$\sqrt{12}\times\sqrt{15}$	(ix)	$\sqrt{10}\times\sqrt{24}\times\sqrt{15}$

2. Simplify the following

(i)	$\left(1+\sqrt{2}\right)+\left(3-2\sqrt{2}\right)$	(ii)	$\left(5\sqrt{2}-2\sqrt{3}\right)-\left(\sqrt{2}+3\sqrt{3}\right)$
(iii)	$2\left(\sqrt{5}-3\sqrt{3}\right)+3\left(2\sqrt{5}+\sqrt{3}\right)$	(iv)	$\sqrt{18}+\sqrt{72}-\sqrt{98}$

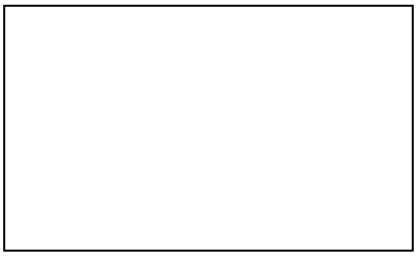
3. Multiply out the brackets and simplify as far as possible.

(i)	$\left(1+\sqrt{2}\right)\left(3-\sqrt{2}\right)$	(ii)	$\left(2-\sqrt{3}\right)\left(3+2\sqrt{3}\right)$
(iii)	$\left(3-2\sqrt{5}\right)\left(1-3\sqrt{5}\right)$	(iv)	$\left(\sqrt{2}+2\sqrt{3}\right)\left(5\sqrt{2}-\sqrt{3}\right)$
(v)	$\left(\sqrt{7}+\sqrt{2}\right)\left(\sqrt{7}-\sqrt{2}\right)$	(vi)	$\left(3-\sqrt{2}\right)^2$

4. Rationalise the denominators of the following.

(i)	$\frac{3}{\sqrt{3}}$	(ii)	$\frac{1}{\sqrt{5}}$	(iii)	$\frac{1+\sqrt{2}}{\sqrt{2}}$
(iv)	$\frac{1}{\sqrt{3}+1}$	(v)	$\frac{\sqrt{2}}{2-\sqrt{2}}$	(vi)	$\frac{1-\sqrt{3}}{2-\sqrt{3}}$
(vii)	$\frac{1+2\sqrt{5}}{3-\sqrt{5}}$	(viii)	$\frac{1+\sqrt{2}}{\sqrt{3}+\sqrt{2}}$	(ix)	$\frac{\sqrt{6}+\sqrt{3}}{\sqrt{6}-\sqrt{3}}$

5. The rectangle below has length $\left(\sqrt{7}+1\right)$ cm. The area of the rectangle is a whole number of cm^2.



$\left(\sqrt{7}+1\right)$

AQA FM Number and Algebra 1 Exercise

Find a possible width for the rectangle and state its area.