

Chapter 8

Surds



Table 8-1: Solution to Example 1

		Type	Notes
a)	$\sqrt{2}$	Surd	They meet the conditions above as they cannot be expressed as a fraction.
b)	$\sqrt{3}$	Surd	
c)	$\sqrt[3]{4}$	Surd	
d)	$\sqrt[5]{7}$	Surd	
e)	$\sqrt{36}$	Non- surd	This is a rational number as $\sqrt{36} = 6$.
f)	$\sqrt{\frac{1}{4}}$	Non- surd	This is a rational number as $\sqrt{\frac{1}{4}} = \frac{1}{2}$.
g)	$\sqrt[3]{27}$	Non- surd	This is a rational number as $\sqrt[3]{27} = 3$.
h)	$\sqrt[5]{32}$	Non- surd	This is a rational number as $\sqrt[5]{32} = 2$.

Table 8-2: Conjugate surds illustrated

	Surd	Conjugate
a)	$a + \sqrt{b}$	$a - \sqrt{b}$
a)	$\sqrt{a} - \sqrt{b}$	$\sqrt{a} + \sqrt{b}$
a)	$a + b\sqrt{c}$	$a - b\sqrt{c}$
a)	$a\sqrt{b} + c\sqrt{d}$	$a\sqrt{b} - c\sqrt{d}$

Table 8-3: Rationalising the denominator illustrated

Case 1	Case 2	Case 3
$\frac{1}{\sqrt{b}} = \frac{1}{\sqrt{b}} \times \frac{\sqrt{b}}{\sqrt{b}}$ $= \frac{\sqrt{b}}{b}$	$\frac{1}{a + \sqrt{b}} = \frac{1}{a + \sqrt{b}} \times \frac{a - \sqrt{b}}{a - \sqrt{b}}$ $= \frac{a - \sqrt{b}}{a^2 - (\sqrt{b})^2}$ $= \frac{a - \sqrt{b}}{a^2 - b}$	$\frac{1}{\sqrt{a} + \sqrt{b}} = \frac{1}{\sqrt{a} + \sqrt{b}} \times \frac{\sqrt{a} - \sqrt{b}}{\sqrt{a} - \sqrt{b}}$ $= \frac{\sqrt{a} - \sqrt{b}}{(\sqrt{a})^2 - (\sqrt{b})^2}$ $= \frac{\sqrt{a} - \sqrt{b}}{a - b}$



Thank You

