

Section 1: Surds

Exercise level 1

Do not use a calculator in this 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) $\sqrt{300}$

2. Simplify the following

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

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

(i) $(1+\sqrt{2})(3-\sqrt{2})$ (ii) $(2-\sqrt{3})(3+2\sqrt{3})$
(iii) $(3-2\sqrt{5})(1-3\sqrt{5})$ (iv) $(3-\sqrt{2})^2$

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) $\frac{\sqrt{2}}{2-\sqrt{2}}$