1 Show that $\frac{6-\sqrt{8}}{\sqrt{2}-1}$ can be written in the form $a+b\sqrt{2}$ where a and b are integers.

(3)

2 $\sqrt{5}(\sqrt{8} + \sqrt{18})$ can be written in the form $a\sqrt{10}$ where a is an integer. Find the value of a.

3 Martin did this question.

Rationalise the denominator of
$$\frac{14}{2 + \sqrt{3}}$$

Here is how he answered the question.

$$\frac{14}{2+\sqrt{3}} = \frac{14\times(2-\sqrt{3})}{(2+\sqrt{3})(2-\sqrt{3})}$$
$$= \frac{28-14\sqrt{3}}{4+2\sqrt{3}-2\sqrt{3}+3}$$
$$= \frac{28-14\sqrt{3}}{7}$$
$$= 4-2\sqrt{3}$$

Martin's answer is wrong.

(a) Find Martin's mistake.

(1)

Sian did this question.

Rationalise the denominator of
$$\frac{5}{\sqrt{12}}$$

Here is how she answered the question.

$$\frac{5}{\sqrt{12}} = \frac{5\sqrt{12}}{\sqrt{12} \times \sqrt{12}}$$
$$= \frac{5 \times 3\sqrt{2}}{12}$$
$$= \frac{5\sqrt{2}}{4}$$

Sian's answer is wrong.

(b) Find Sian's mistake.

4 Show that $\frac{(\sqrt{18} + \sqrt{2})^2}{\sqrt{8} - 2}$ can be written in the form $a(b + \sqrt{2})$ where a and b are integers.

(3)

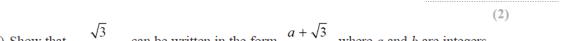
5 (a) Express $\sqrt{3} + \sqrt{12}$ in the form $a\sqrt{3}$ where a is an integer.

(2)

(b) Express $\left(\frac{1}{\sqrt{3}}\right)^7$ in the form $\frac{\sqrt{b}}{c}$ where b and c are integers.



6 (a) Rationalise the denominator of $\frac{22}{\sqrt{11}}$ Give your answer in its simplest form.



(b) Show that $\frac{\sqrt{3}}{2\sqrt{3}-1}$ can be written in the form $\frac{a+\sqrt{3}}{b}$ where a and b are integers.

7 Show that $\frac{\sqrt{180} - 2\sqrt{5}}{5\sqrt{5} - 5}$ can be written in the form $a + \frac{\sqrt{5}}{b}$ where a and b are integers.

(4)

8 Show that $\frac{8+\sqrt{12}}{5+\sqrt{3}}$ can be written in the form $\frac{a+\sqrt{3}}{b}$, where a and b are integers.