*Autumn 2017 Paper 1 Q21*

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

**(Total for Question 1 is 3 marks)**

*Summer 2018 Paper 1 Q13*

**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 $a$.

$a$ = ..........................................................

**(Total for Question 2 is 3 marks)**

*Summer 2018 Paper 2 Q20*

**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.

..............................................................................................................................................

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**(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.

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**(1)**

**(Total for Question 3 is 2 marks)**

*Summer 2019 Paper 1 Q18*

**4** (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.

..........................................................

**(3)**

**(Total for Question 4 is 5 marks)**

*Summer 2020 Paper 1 Q20*

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

**(Total for Question 5 is 4 marks)**

*Summer 2021 Paper 1 Q19*

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

**(Total for Question 6 is 4 marks)**

*Autumn 2018 Paper 1 Q20*

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

**(Total for Question 7 is 3 marks)**

Autumn 2019 Paper 1 Q16

**8** (a) Rationalise the denominator of $\frac{22}{\sqrt{11}}$

Give your answer in its simplest form.

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**(2)**

(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.

**(3)**

**(Total for Question 8 is 5 marks)**