13

(2)

Given that y is a prime number,

(b) express $\dfrac{3}{2-\sqrt{y}}$ in the form $\dfrac{a+b\sqrt{y}}{c-y}$ where a, b and c are integers.

(2)

(Total for Question 13 is 4 marks)

16 (a) Rationalise the denominator of $\dfrac{a+\sqrt{4b}}{a-\sqrt{4b}}$ where a is an integer and b is a prime number.

Simplify your answer.

16 Without using a calculator, show that $\frac{12}{\sqrt{2}-1} - \left(\sqrt{2}\right)^5 = 2\sqrt{32} + 12$

Show your working clearly.

(Total for Question 16 is 3 marks)

16 Show that $\frac{4+\sqrt{8}}{\sqrt{2}-1}$ can be written in the form $a + b\sqrt{2}$, where a and b are integers.

Show each stage of your working clearly and give the value of a and the value of b.

(Total for Question 16 is 3 marks)

16 Show that $\dfrac{2\sqrt{3}}{\sqrt{3}-1}$ can be written in the form $a + \sqrt{a}$ where a is an integer.

Show your working clearly.

(Total for Question 16 is 3 marks)

17 Show that $\frac{1+\sqrt{5}}{3-\sqrt{5}}$ can be written in the form $a + \sqrt{b}$ where a and b are integers.

Show each stage of your working clearly.

(Total for Question 17 is 3 marks)

17

(b) Show that $\dfrac{5-\sqrt{18}}{1-\sqrt{2}}$ can be written in the form $a + b\sqrt{2}$

where a and b are integers.
Show each stage of your working clearly.

(3)

(Total for Question 17 is 4 marks)

17 (a)

(b) Express $\dfrac{7}{2-\sqrt{3}}$ in the form $\sqrt{c}+d$ where c and d are integers.

Show your working clearly.

.....

(3)

(Total for Question 17 is 4 marks)

17

(b) Show that $\dfrac{5-\sqrt{2}}{\sqrt{2}-1}$ can be written in the form $a+b\sqrt{2}$ where a and b are integers.

(3)

(Total for Question 17 is 4 marks)

17 Express $\frac{8}{\sqrt{5}-1}$ in the form $\sqrt{a}+b$ where a and b are integers.

Show each stage of your working clearly.

.....

(Total for Question 17 is 3 marks)

17 Show that $\dfrac{\sqrt{12}}{\sqrt{3}+2}$

can be written in the form $a + \sqrt{b}$ where a and b are integers.

(Total for Question 17 is 3 marks)

18 Show that $\dfrac{\sqrt{8}}{\sqrt{8}-2}$ can be written in the form $n+\sqrt{n}$, where n is an integer.

Show your working clearly.

(Total for Question 18 is 3 marks)

19 Without using a calculator, rationalise the denominator of $\frac{6}{3-\sqrt{7}}$

Simplify your answer.
You must show each stage of your working.

.....

(Total for Question 19 is 3 marks)

20 The area of a rectangle is $18\,\text{cm}^2$

The length of the rectangle is $\left(\sqrt{7}+1\right)$ cm.

Without using a calculator and showing each stage of your working,

find the width of the rectangle.
Give your answer in the form $a\sqrt{b}+c$ where a, b and c are integers.

..... cm

(Total for Question 20 is 3 marks)

21

(b) Express $\frac{2}{\sqrt{3}-1}$ in the form $p + \sqrt{q}$

where p and q are integers.
Show your working clearly.

.....

(2)

21 Express $\dfrac{3+\sqrt{8}}{\left(\sqrt{2}-1\right)^2}$ in the form $p+\sqrt{q}$ where p and q are integers.

Show each stage of your working clearly.

.....

(Total for Question 21 is 4 marks)

23 The diagram shows a cuboid with a square cross section.

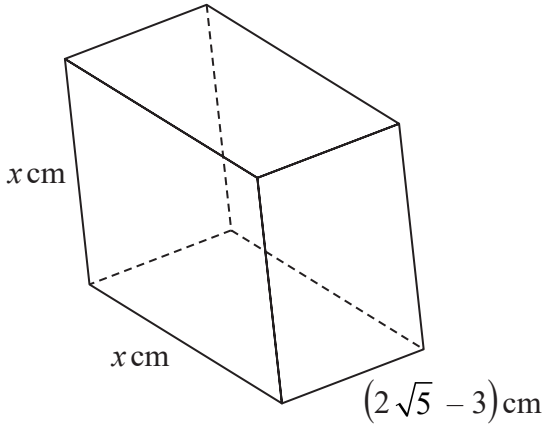

Diagram **NOT** accurately drawn

The volume of the cuboid is $(13 + 6\sqrt{5})\text{cm}^3$

Without using a calculator, find the value of x
Give your answer in the form $a + \sqrt{b}$ where a and b are integers.
Show your working clearly.

$x =$ .....

(Total for Question 23 is 4 marks)