EXAM PAPERS PRACTICE

GCSE OCR Math J560

Surds

Question Paper

"We will help you to achieve A Star "

Question 1

Work out the value of $\left(\sqrt{12} - \sqrt{3}\right)^2$

[2 marks]

Question 2

ABD is a right angled triangle.

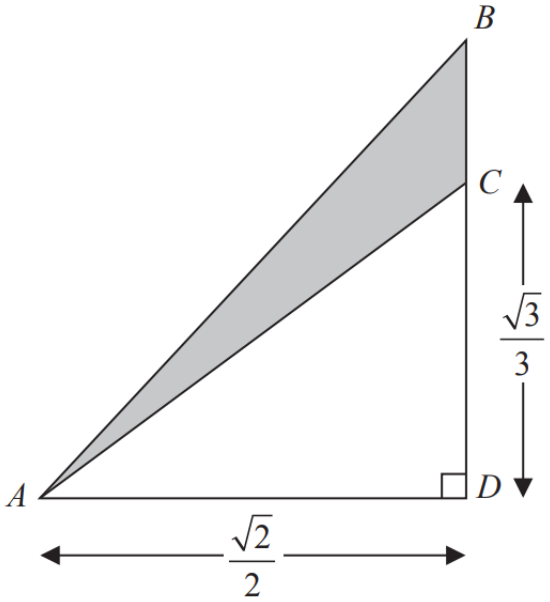

Diagram **NOT** accurately drawn

All measurements are given in centimetres.

C is the point on BD such that $CD = \frac{\sqrt{3}}{3}$

$AD = BD = \frac{\sqrt{2}}{2}$

Work out the exact area, in cm^2, of the shaded region.

[3 marks]

Question 3

(a) Rationalise the denominator of $\frac{12}{\sqrt{3}}$

[2 marks]

Question 4

Show that $\frac{(4-\sqrt{3})(4+\sqrt{3})}{\sqrt{13}}$ simplifies to $\sqrt{13}$

[2 marks]

Question 5

Rationalise the denominator of $\frac{10}{\sqrt{5}}$

Give your answer in its simplest form.

[2 marks]

Question 6

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

Find the value of a.

[3 marks]

Question 7

(a) Rationalise the denominator of $\frac{5}{\sqrt{2}}$

[2 marks]

Question 8

(b) Expand and simplify $(2 + \sqrt{3})^2 - (2 - \sqrt{3})^2$

[2 marks]

Question 9

$a = \sqrt{8} + 2$

$b = \sqrt{8} - 2$

$T = a^2 - b^2$

Work out the value of T.
Give your answer in the form $c\sqrt{2}$ where c is an integer.

[4 marks]

Question 10

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 marks]

Question 11

Simplify fully $\frac{(6-\sqrt{5})(6+\sqrt{5})}{\sqrt{31}}$

You must show your working.

[3 marks]

Question 12

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 mark]

Question 13

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.

[1 mark]

Question 14

Show that $\dfrac{1}{1+\dfrac{1}{\sqrt{2}}}$ can be written as $2-\sqrt{2}$

[3 marks]