



EXAM PAPERS PRACTICE

GCSE Edexcel Math

1MA1

Surds

Question Paper

*"We will help you to
achieve A Star"*



Question 1

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

[2 marks]

Question 2

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

[2 marks]

Question 3

ABD is a right angled triangle.

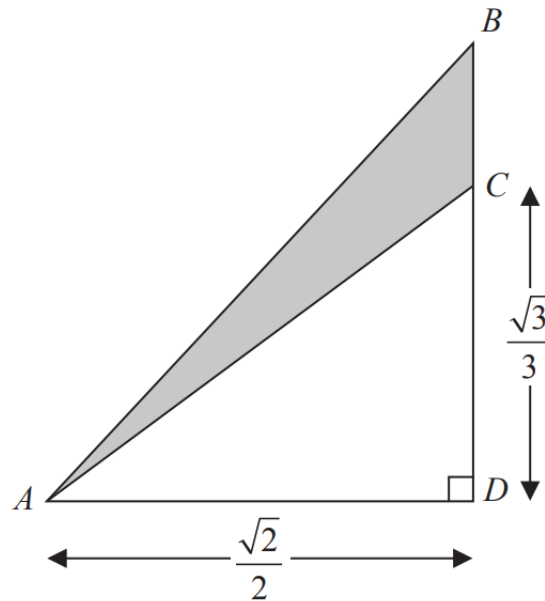


Diagram **NOT** accurately drawn

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 4

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

[2 marks]

Question 5

(b) Work out the value of $(\sqrt{2} + \sqrt{8})^2$

[2 marks]

Question 6

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

Give your answer in its simplest form.

[2 marks]



Question 7

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

Find the value of a .

[3 marks]

Question 8

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

[2 marks]

Question 9

Expand $(1 + \sqrt{2})(3 - \sqrt{2})$

Give your answer in the form $a + b\sqrt{2}$ where a and b are integers.

[2 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

Sian did this question.

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

Here is how she answered the question.

$$\begin{aligned}\frac{5}{\sqrt{12}} &= \frac{5\sqrt{12}}{\sqrt{12} \times \sqrt{12}} \\ &= \frac{5 \times 3\sqrt{2}}{12} \\ &= \frac{5\sqrt{2}}{4}\end{aligned}$$

Sian's answer is wrong.

(b) Find Sian's mistake.

[1 mark]

Question 12

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

[3 marks]



Question 13

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

[2 marks]

Question 14

$$a = \sqrt{8} + 2$$

$$b = \sqrt{8} - 2$$

$$T = a^2 - b^2$$

Work out the value of T .

Give your answer in the form $c\sqrt{2}$ where c is an integer.

[4 marks]



Question 15

Martin did this question.

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

Here is how he answered the question.

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

Martin's answer is wrong.

(a) Find Martin's mistake.

[1 mark]