

Write your name here

Surname	Other names
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Pearson Edexcel
Level 1 / Level 2
GCSE (9–1)

Centre Number

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Candidate Number

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Mathematics

Surd problems

Higher Tier

Time: 1 hour

Paper Reference

1MA1

You must have: Ruler graduated in centimetres and millimetres, protractor, pair of compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*
- You must **show all your working**.
- The questions in this paper were originally provided with diagrams; you should try to sketch diagrams from information given to help you answer each question.
- **Calculators may be used.**
- If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.



Information

- There are 15 questions. The total mark for this paper is 47.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

Advice

- Read each question carefully before you start to answer it.
- Keep an eye on time.
- Try to answer every question.
- Check your answers if you have time at the end.

1. Make y the subject of the formula $p = \sqrt{\frac{x+y}{5}}$

.....
(Total 3 marks)

2. Expand $(1 + \sqrt{2})(3 - \sqrt{2})$
Give your answer in the form $a + b\sqrt{2}$ where a and b are integers.

.....
(Total 2 marks)

3. Rationalise the denominator of $\frac{(4 + \sqrt{2})(4 - \sqrt{2})}{\sqrt{7}}$
Give your answer in its simplest form.

.....
(Total 3 marks)

4. Make t the subject of the formula

$$p = \sqrt{\frac{3t}{a}}$$

.....
(Total 3 marks)

5. Write $\sqrt{75}$ in the form $k\sqrt{3}$, where k is an integer.

.....
(Total 2 marks)

6. (a) Expand and simplify $(2\sqrt{5} + 1)(3\sqrt{5} - 1)$

.....
(2)

- (b) Write $\frac{6}{\sqrt{12}}$ in the form \sqrt{n} , where n is an integer.

.....
(2)

(Total 4 marks)

7. Rationalise the denominator of $\frac{14}{\sqrt{7}}$.
Give your answer in its simplest form.

.....
(2)

(Total 2 marks)

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

.....
(2)

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

.....
(2)

(Total 4 marks)

9. Write $(5 - \sqrt{5})^2$ in the form $a + b\sqrt{5}$, where a and b are integers.

.....
(Total 2 marks)

10. $\frac{\sqrt{3}}{5} + \frac{2}{\sqrt{3}} = a\sqrt{3}$, where a is a fraction.

Find the value of a .

.....
(Total 3 marks)

11. $5\sqrt{5}$ can be written in the form 5^k

(a) Find the value of k .

.....
(1)

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

.....
(2)

(Total 3 marks)

12. The perimeter of a square is $\sqrt{120}$ cm.

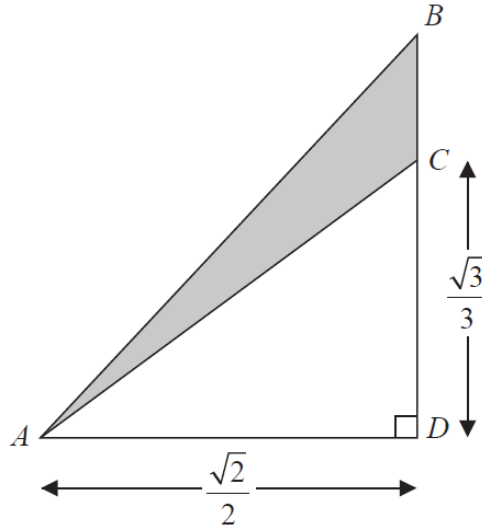
Work out the area of the square.

Give your answer in its simplest form.

..... cm²

(Total 3 marks)

13. ABD is a right angled triangle.



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.

..... cm^2

(Total 3 marks)

14. Here is a trapezium.

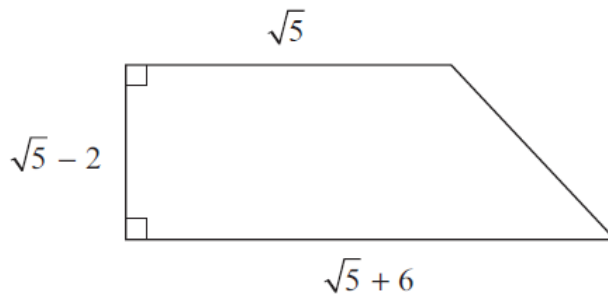


Diagram **NOT** accurately drawn

All measurements shown are in centimetres.

Work out the area of the trapezium.

Give your answer in cm^2 in the form $a\sqrt{5} + b$ where a and b are integers.

..... cm^2

(Total 3 marks)

15. Solve $\frac{2}{x+1} + \frac{x}{2x+3} = 1$

Give your solutions as surds.

.....

(Total 4 marks)