

Types of Numbers

Please write clearly in block capitals

Forename:

Surname:

Materials

For this paper you must have:

- mathematical instruments



You *can* use a calculator.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

Advice

- In all calculations, show clearly how you work out your answer.

1 Consider the numbers below

(Level 3)

π

$\sqrt{144}$

$\sqrt{81}$

0

$\sqrt{-2}$

$\sqrt{1000}$

1(a) Write down the numbers which are rational.

[1 mark]

Answer _____

1(b) Write down the numbers which are irrational.

[1 mark]

Answer _____

Turn over for next question

2(a) \sqrt{m} is an integer.*(Level 3)*Given that the value of m lies between 29 and 39Write down the value of m .**[1 mark]**

Answer _____

2(b)

Which of the following are irrational numbers between 1 and 2.

$\sqrt{2}$

$\sqrt{3}$

$\sqrt{5.25}$

$\sqrt{4}$

You may select more than one answer.

[1 mark]

Answer _____

Turn over for next question

3 Consider the expressions below

(Level 4)

$$2\sqrt{4}$$

$$-\frac{2}{5}$$

$$\sqrt{7}$$

$$\sqrt{7}$$

3(a) Show that one of these expressions is an integer

[1 mark]

Answer _____

3(b) Two of the expressions shown above are multiplied together to produce an integer
Identify which two expressions.

[1 mark]

Answer _____ and _____



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4 Consider the equation below

(Level 4)

$$x^2 + 3y = 10$$

4(a) By use of trial and improvement or otherwise, find a solution for x and y which gives a rational solution.

[1 mark]

Answer _____

The following equation has no integer solutions:

$$6x + 3y = 5$$

4(b) Provide a solution for x and y which gives a rational solution.

[1 mark]

$x =$ _____ $y =$ _____



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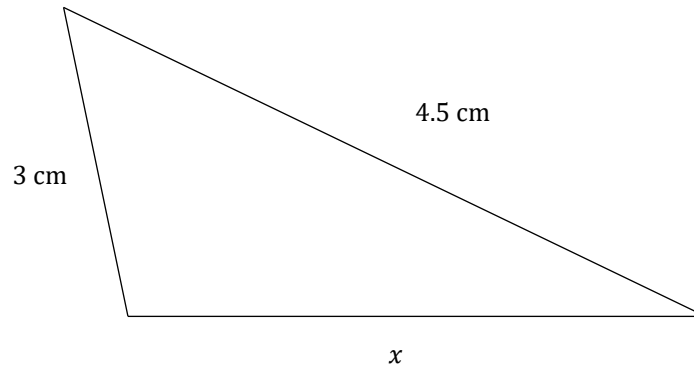
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5

Consider the triangle below.

(Level 5)

The perimeter of the triangle is 13.6 cm Not drawn
accurately

5(a)

Is x an integer?

You must show your working

[2 marks]

Answer _____

5(a)

Is x a rational or irrational?

You must explain your answer.

[2 marks]

Answer _____

Turn over for next question

6 Consider the statements below.

(Level 5)

For each of the statements, tick whether they are always true, sometimes true or never true

[5 marks]

	Always true	Sometimes true	Never true
Rational + Irrational = Rational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Integer + Rational = Rational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rational \times Rational = Integer	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrational \times Rational = Rational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Irrational + Irrational = Rational	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



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