

Please check the examination details below before entering your candidate information

Candidate surname

Other names

Centre Number

Candidate Number

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## Pearson Edexcel Level 3 GCE

Monday 18 October 2021 – Afternoon

Paper  
reference

**9MA0/31**

# Mathematics

Advanced

**PAPER 31: Statistics**

**You must have:**

Mathematical Formulae and Statistical Tables (Green), calculator

Total Marks

**Candidates may use any calculator allowed by Pearson regulations. Calculators must not have the facility for symbolic algebra manipulation, differentiation and integration, or have retrievable mathematical formulae stored in them.**

### Instructions

- Use **black** ink or ball-point pen.
- If pencil is used for diagrams/sketches/graphs it must be dark (HB or B).
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions and ensure that your answers to parts of questions are clearly labelled.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- You should show sufficient working to make your methods clear. Answers without working may not gain full credit.
- Values from statistical tables should be quoted in full. If a calculator is used instead of tables the value should be given to an equivalent degree of accuracy.
- Inexact answers should be given to three significant figures unless otherwise stated.

### Information

- A booklet 'Mathematical Formulae and Statistical Tables' is provided.
- The total mark for this part of the examination is 50. There are 6 questions.
- 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.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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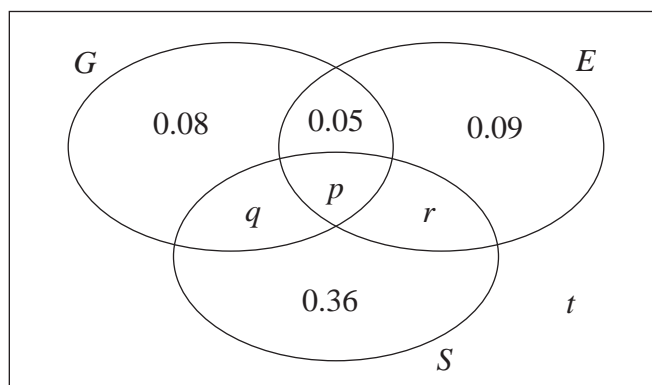
4. A large college produces three magazines. One magazine is about green issues, one is about equality and one is about sports. A student at the college is selected at random and the events  $G$ ,  $E$  and  $S$  are defined as follows

$G$  is the event that the student reads the magazine about green issues

$E$  is the event that the student reads the magazine about equality

$S$  is the event that the student reads the magazine about sports

The Venn diagram, where  $p$ ,  $q$ ,  $r$  and  $t$  are probabilities, gives the probability for each subset.



- (a) Find the proportion of students in the college who read exactly one of these magazines.

(1)

No students read all three magazines and  $P(G) = 0.25$

- (b) Find

(i) the value of  $p$

(ii) the value of  $q$

(3)

Given that  $P(S | E) = \frac{5}{12}$

- (c) find

(i) the value of  $r$

(ii) the value of  $t$

(4)

- (d) Determine whether or not the events  $(S \cap E')$  and  $G$  are independent. Show your working clearly.

(3)

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