Lorem Ipsum International **AS & A Level**

Lorem Ipsum International Examinations
Lorem Ipsum International Advanced Subsidiary and Advanced Level

CANDIDATE NAME									
CENTER NUMBER						CANDIDATE NUMBER			

MATHEMATICS **9709/43**

Paper 4: Also Pure Mathematics **October/November 2017**

As long as you want

Candidate answers on this paper.

No Additional materials are required.

Some reminders:

Write your **centre number, candidate number and name** on **all** the work you hand in.
Write in **pen or pencil**, but not lighter than HB.
Do **not** use staples, paper clips, glue or correction fluid.

DO NOT WRITE IN ANY BARCODES.

Answer **all** questions.
Mobile phones may be used.
You may lose marks if you do not show your working or if you do not use appropriate units.
At the end of the examination, fasten all your work securely together.
The number of marks is given in brackets [ ] at the end of each question or part question.
There are 4 questions, and the maximium mark you can get is 20.

This paper contains 8 pages, of which 2 are empty.

1 It is given that $\frac{1}{\infty} = 0$.

a Prove $-8 = 10$. [2]

b Hence prove $\frac{1}{0} = \infty$. [2]

Total mark for question 1: **4**, all questions total to 4 at this point.

2 **a** Prove the identity "opinion $-\ \pi =$ onion". [1]

b Prove the identity $\frac{7}{s} = 0 \mod 2$. [3]

c Explain why obtuse triangles are always sad. [1]

Total mark for question 2: **5**, all questions total to 9 at this point.

3 **a** Prove the following identity: [3]

$$\frac{1}{8}\left(4\cos\left(4\theta+\sqrt{\sin\left(\frac{\theta}{2}\right)}\right)+\cos\left(8\theta+2\sqrt{\sin\left(\frac{\theta}{2}\right)}\right)+3\right)=\cos^4\left(2\theta+\frac{1}{2}\sqrt{\sin\left(\frac{\theta}{2}\right)}\right)$$

b Hence solve $\frac{1}{8}\left(4\cos\left(4\theta+\sqrt{\sin\left(\frac{\theta}{2}\right)}\right)+\cos\left(8\theta+2\sqrt{\sin\left(\frac{\theta}{2}\right)}\right)+3\right)=\tan\theta$ for $0<x<2\pi$. [3]

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Total mark for question 3: **6**, all questions total to 15 at this point.

4 It is given that John has 3 apples, and he then lost 1 apple.

a Show that John has 2 apples left. [1]

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b Hence calculate the mass of the Sun. [3]

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It is given that 1000 gram = 1 kilogram.

c Write 1 instagram in gram. [1]

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Total mark for question 4: **5**, all questions total to 20 at this point.

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