

Our next meeting

**Tuesday, November 3rd 2015
5pm for 5.30pm**

**MALL 1, School of Mathematics
The University of Leeds**

**Dr Lindsay Lee
Leverhulme Research Fellow
School of Earth and the
Environment
University of Leeds**

***A statistical toolbox to help us
understand climate and weather
models***

Advances in computing power mean that it is now possible to use statistics to unravel the increased complexity of weather and climate models. This talk will introduce some of the most powerful statistical methods available to weather and climate science.

**Thursday, December 3rd 2015 at 7pm
for 7.30pm, MALL 1, School of
Mathematics, University of Leeds**

Christmas Quiz and Buffet

Our famous Christmas Quiz in which everyone wins prizes!

London Mathematical Society

Popular Lectures

Wednesday, November 11th, 2015

in the Great Hall, University of Leeds
6.30pm – 9pm

Hannah Fry

Patterns in human behaviour

Joan Lasenby

***The Mathematics of Processing
Digital Images***

Attendance is free but tickets must be booked
in advance from

<https://www.lms.ac.uk/events/popular-lectures>

School parties welcome

Advance Notice

W.P.Milne Lecture for Sixth Formers

***The Mathematics of Animal
Locomotion***

Martyn Parker

Keele University

**Wednesday, March 23rd 2016
at 2.30pm**

This lecture will be part of a Mathematics Day for post GCSE pupils – details will shortly be circulated to schools.

Non-members will be welcome at these meetings. Please bring them to the attention of your colleagues and friends and encourage them to come along. Our meetings are very friendly and include refreshments.

Anyone who would like to be added to our email list should send their name and email address to a.slomson@leeds.ac.uk

For more information about the Yorkshire Branch of the Mathematical Association, please go to our website <http://ybma.org.uk>.

Officers of the Yorkshire Branch of the Mathematical Association 2014-15

President: Alan Slomson (a.slomson@leeds.ac.uk)

Secretary: Bill Bardelang (rgb@bardelang.plus.com)

Treasurer: Jane Turnbull (da.turnbull@ntlworld.com)

see overleaf for Mathematics in the Classroom.

Mathematics In the Classroom

An enveloped area

This problem arose in Dr Vicky Neale's talk on October 17th.

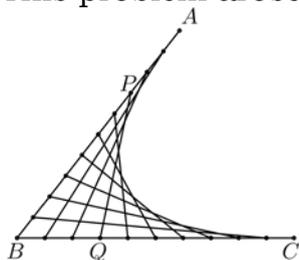


Figure 1

In Figure 1 the point P divides the line segment AB in the same ratio as the point Q divides BC , that is, $AP : PB = BQ : QC$. If pairs of points with these properties are joined, they envelope a curve. In the talk Vicky proved that this curve is a parabola.

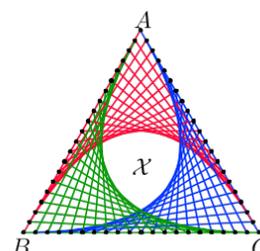


Figure 2

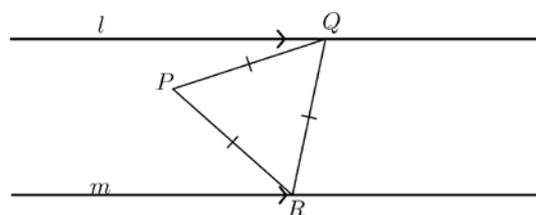
In Figure 2, ABC is an equilateral triangle in which three of these parabolic envelopes have been drawn. They bound the region marked X .

What is the ratio of the area of X to the area of the triangle ABC ?

An Equilateral Triangle

Let l and m be two lines which are parallel and let P be point which is between these lines. In the last Newsletter we asked:

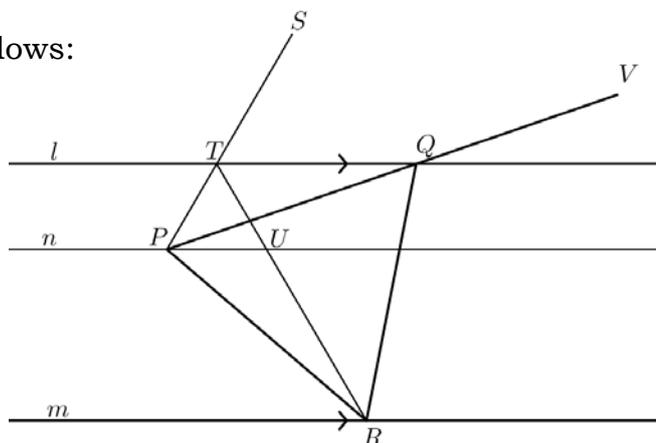
Can you construct, using just a straight edge and a compass, an equilateral triangle which has as its vertices, the point P , a point Q which is on the line l , and a point R which is on the line m ?



A solution

One construction that work is as follows:

- (1) Construct the line, n , through P which is parallel to l .
- (2) Construct the line PS through P that makes an angle 60° with the line n .
- (3) Construct the point T where PS meets the line l .
- (4) Construct the point U on n such that $PU = PT$.
- (5) Extend the line TU to meet the line m at R .
- (6) Construct the line PV through P making an angle 60° with PR .
- (7) Construct the point Q where this line meets the line l .



Then PQR is the required equilateral triangle.

This may be proved by first showing that the triangles PTQ and PUR are congruent. It then follows that $PQ = PR$ and therefore, as PQ has been constructed to make an angle 60° with PR , it follows that PQR is an isosceles triangle.

Note that the construction can be generalized to cover the cases where the lines l and m are not parallel. However, it is then necessary to consider separately the cases where the angle between the lines l and m is less than 60° , equal to 60° , and greater than 60° .