



Coimisiún na Scrúduithe Stáit
State Examinations Commission

Cor na Madadh, Baile Átha Luain, Co. na hIarmhí
Cornamaddy, Athlone, Co. Westmeath

S.60/09

To: Management Authorities of Second-Level Schools

Re: *Formulae and Tables* booklet

Dear Principal,

I refer to the State Examinations Commission Circular No. S.56/09 (copy enclosed) and I now enclose three copies of the new *Formulae and Tables* booklet. This new booklet will be used in the **2010 examinations and thereafter**, and the older *Mathematics Tables* booklet will no longer be provided.

The new booklet is now available in book shops and directly from the Government Publications Sale Office. As with the previous booklet, candidates will **not** be allowed to bring their own copies into the examinations. Copies will be available from the superintendents in the examination centres.

SEC Circular S.56/09 referred to some changes in presentation that will arise on some examination papers to coincide with the introduction of the new booklet. In particular, in questions related to geometry on mathematics papers in 2010 and thereafter, upper-case letters will be used to denote points and lower-case letters to denote lines and circles. This applies to mathematics examinations in the Junior Certificate, Leaving Certificate and Leaving Certificate Applied. The notation for geometry is given on page 17 of the *Formulae and Tables* booklet. Some examples of relevant questions from recent examination papers are given as an appendix to this circular. Each example is followed by a presentation of how the same question would appear from 2010 onwards.

Teachers and students should note the information in SEC Circular S.56/09 regarding the content of the new booklet and its relevance for a number of subject areas. They should furthermore note the general principle that information in the *Formulae and Tables* booklet will not be repeated on an examination paper and the implications of this principle for the examinations **in 2011 and thereafter**. Circular S.56/09 also referred to further information in respect of Leaving Certificate Construction Studies. This will issue to schools in due course.

To obviate confusion in the future it is suggested that copies of the existing *Mathematical Tables* booklet be disposed of, in an environmentally responsible manner.

School management authorities are asked to bring this information to the attention of the representatives of parents and teachers on the board of management, or other appropriate representatives of parents and teachers, for transmission to individual parents and teachers.

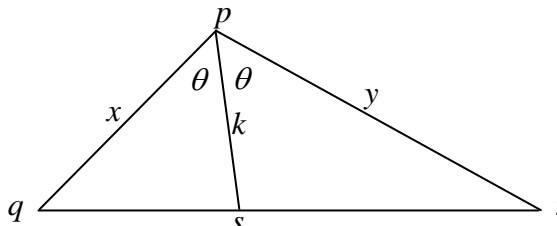
If you have any queries in relation to this circular, please call (090) 644 2765.

Tom Carney,
Assistant Principal
August, 2009

Appendix: Examples of change in geometry notation.

Leaving Certificate Higher Level Paper 2, 2009, Question 4(c), as presented:

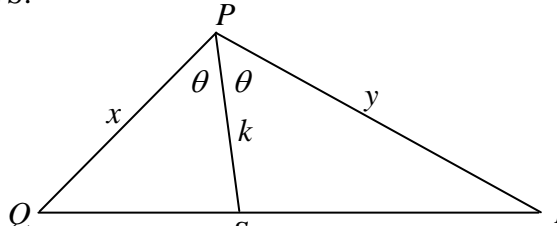
(c) The bisector of $\angle qpr$ meets $[qr]$ at s .
 $|\angle qpr| = 2\theta$, $|pq| = x$,
 $|pr| = y$ and $|ps| = k$.



(i) Find the area of the triangle pqs in terms of x , k and θ .
(ii) Show that $k = \frac{2xy \cos \theta}{x + y}$.

The above question as it might appear in the future:

(c) The bisector of $\angle QPR$ meets $[QR]$ at S .
 $|\angle QPR| = 2\theta$, $|PQ| = x$,
 $|PR| = y$ and $|PS| = k$.



(i) Find the area of the triangle PQS in terms of x , k and θ .
(ii) Show that $k = \frac{2xy \cos \theta}{x + y}$.

Leaving Certificate Higher Level Paper 2, 2009, Question 2(b), as presented:

(b) In the triangle abc , p is a point on the side $[bc]$.
The point q lies outside the triangle such that $\vec{pq} = \vec{pb} + \vec{pc} - \vec{pa}$.

(i) Express \vec{q} in terms of \vec{a} , \vec{b} and \vec{c} .
(ii) Hence show that $abqc$ is a parallelogram.

The above question as it might appear in the future:

- (b) In the triangle ABC , P is a point on the side $[BC]$.
The point Q lies outside the triangle such that $\overrightarrow{PQ} = \overrightarrow{PB} + \overrightarrow{PC} - \overrightarrow{PA}$.
- (i) Express \vec{q} in terms of \vec{a} , \vec{b} and \vec{c} .
- (ii) Hence show that $ABQC$ is a parallelogram.

In part (i) above, note that the vector \overrightarrow{OQ} , where O is the origin, is written when using a single letter as \vec{q} , (see page 17 of the *Formulae and Tables* booklet). This part could equally well be stated as: (i) Express \overrightarrow{OQ} in terms of \overrightarrow{OA} , \overrightarrow{OB} and \overrightarrow{OC} .

Junior Certificate Higher Level Paper 2, 2009, Question 2(c), as presented:

- (c) (i) ✍ Verify that the points $(3, 0)$ and $(0, -2)$ are on the line $L: 2x - 3y = 6$.
- (ii) ✍ Find the equation of the line K through $(3, 0)$ which is perpendicular to L .
- (iii) ✍ Show the lines L and K on a coordinate diagram on graph paper.
- (iv) ✍ Find the area of the triangle formed by the lines L and K and the y -axis.

The above question as it might appear in the future:

- (c) (i) ✍ Verify that the points $(3, 0)$ and $(0, -2)$ are on the line $l: 2x - 3y = 6$.
- (ii) ✍ Find the equation of the line k through $(3, 0)$ which is perpendicular to l .
- (iii) ✍ Show the lines l and k on a coordinate diagram on graph paper.
- (iv) ✍ Find the area of the triangle formed by the lines l and k and the y -axis.

Note that subscripts may also be used, where convenient, so that the lines l and k above could equally well be labelled l_1 and l_2 .

