

MATHEMATICAL TRIPOS Part III

Thursday 8 June, 2006 9 to 12

PAPER 18

CURVES AND JACOBIANS

Attempt **THREE** questions.

There are **FIVE** questions in total.

The questions carry equal weight.

STATIONERY REQUIREMENTS

Cover sheet
Treasury Tag
Script paper

SPECIAL REQUIREMENTS

None

<p>You may not start to read the questions printed on the subsequent pages until instructed to do so by the Invigilator.</p>
--

- 1** State and prove the Riemann bilinear relations. Explain their significance in the construction of the Jacobian $Jac(X)$ of X .

- 2** State and prove Abel's theorem. (Any result about the existence and structure of the quotient of an algebraic variety by a finite group may be assumed.)

- 3** State and prove a theorem that describes the derivative of the Abelian sum map $u_d : X^{(d)} \rightarrow Jac(X)$.

- 4** State and prove Riemann's singularity theorem, concerning the image W_{g-1} of u_{g-1} .

- 5** Give a proof of the Torelli theorem. General results about the duality of projective varieties may be quoted without proof.

END OF PAPER