UNIVERSITY OF CAMBRIDGE

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

You may not start to read the questions printed on the subsequent pages until instructed to do so by the Invigilator.

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 $u_d : X^{(d)} \to Jac(X)$.

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