

MA377 EXAMPLE SHEET V

- Q. 1.** Find all real algebras of dimension two.
- Q. 2.** Show A is semisimple if and only if every module is projective.
- Q. 3.** Prove that any two projective covers are isomorphic.
- Q. 4.** Let $\Gamma(n)$ be the directed graph

$$\bullet \rightarrow \bullet \rightarrow \dots \rightarrow \bullet$$

with n vertices. Find $n(n+1)/2$ distinct indecomposable modules.

Q. 5. Let $A(n)$ be the path algebra of $\Gamma(n)$. Find the Cartan matrix of $A(n)$.

Q. 6. Find the Cartan matrix of a semisimple algebra.