

MATH 242 - SYMPLECTIC GEOMETRY LECTURE NOTES

ANTON

Throughout, let G be a finite group and let R be a ring with 1.

Theorem 0.1. (*Exercise 18.2.1*) *Prove that conditions (1) and (2) of Wedderburn's Theorem are equivalent.*

Proof. We must show that all R -modules are projective if and only if they are injective. Let P be a projective R -module and $f : A \rightarrow B$

$$\begin{array}{ccc}
 S & \xrightarrow{J} & N \\
 \uparrow K & \nearrow f & \downarrow g \\
 P & \xrightarrow{Z} & M
 \end{array}$$

(Note: A dotted arrow labeled f' also points from P to N in the original image.)

□