Problem 3.11:

Proof:

Given that $(G, *)$ is a group and $x^2 = e$ for all x in G, want to show $x*y = y*x$ for any x, y in G. We know xy is in G. So then, xyxy=e. Left multiplying both sides by x, we get xxyxy=xe=x. But xxyxy=yxy. Then right multiplying both sides by y, we get yxyy=xy. So then yx=xy and $(G, *)$ is abelian.