Math 214 – Foundations of Mathematics   Homework 1/28   Sam Harrington

(Due Tuesday, February 11)

Proposition 1.8: If m is an integer, then $(-m) + m = 0$.

Proof. Let m be an integer. Then,

$$\begin{aligned} (-m) + m &= m + (-m) && \text{(Axiom 1.1(i))} \\ &= 0 && \text{(Axiom 1.4)} \end{aligned}$$

$\square$

Proposition 1.11(vi): If m, n, p, q are integers, then

$$(m(n+p))q = (mn)q + m(pq).$$

Proof. Let m, n, p, q be integers. Then,

$$\begin{aligned} (m(n+p))q &= (mn + mp)q && \text{(Axiom 1.1(iii))} \\ &= (mn)q + (mp)q && \text{(Prop. 1.6)} \\ &= (mn)q + m(pq) && \text{(Axiom 1.1(v))} \end{aligned}$$

$\square$