Proposition HW10.1: Let A be a set, and let $\sim$ be an equivalence relation on A. Then the equivalence classes of $\sim$ form a partition of A.

Proof . □

Proposition HW10.2: Let A and B be sets. Then

$$(A \cup B) \setminus B \subseteq A.$$

Proof . □

Lemma 6.13c: Let $n \in \mathbb{N}$. Suppose that q and r are integers such that $0 \leq r \leq n - 1$ and

$$qn + r = 0.$$

Then $q = 0$ and $r = 0$.

Proof . □

Proposition 6.25: If $a \equiv a' \pmod{n}$ and $b \equiv b' \pmod{n}$ then

$$a + b \equiv a' + b' \pmod{n}$$

and

$$ab \equiv a'b' \pmod{n}.$$

Proof. □

Lemma HW10.3: Suppose $n \in \mathbb{N}$, $a, b \in \mathbb{Z}$, $2 \leq a \leq n - 1$, and $ab = n$. Then

$$2 \leq b \leq n - 1.$$

Proof. □

Proposition 6.28: Every integer greater than or equal to 2 can be factored in to primes.

Proof. Wait until after Monday to start this one. □