1. Let $R$ be a ring. Use the ring axioms to show that for any $a \in R$, $a \times 0 = 0$. Hint: Consider $a(0 + 1)$.

2. Let $R$ a ring and $I$ an ideal of $R$. If $I$ contains 1, what does $I$ have to be?

3. Show that the kernel of a homomorphism is an ideal.