Consider the following sets. Determine whether the properties of a ring I have indicated are satisfied.

1. $R = \left\{ r\sqrt{2} \,\middle|\, r \in \mathbb{Q} \right\}$. Check closure for both operations and one of the distributive properties/laws.

2. $R = \left\{ \dfrac{1}{n} \,\middle|\, n \in \mathbb{N} \right\}$. Check closure for both operations, and of the distributive properties, and the existence of an additive identity (property *c* on page 673)