1. Use induction to prove that $a^m \cdot a^n = a^{m+n}$ for all $n \in \mathbb{N}$. (You’re proving this for all $m \in \mathbb{N}$. Recall the discussion from class about using an “arbitrary” element to prove universally qualified statements. So your induction is on $n$.)

2. Use induction to prove that a convex $n$-gon contains $\frac{1}{2}n(n-3)$ diagonals. (A diagonal of a convex $n$-gon is the line segment joining two nonadjacent vertices, i.e., vertices that don’t share an edge.)