8/30

Nathan Keough

Acknowledgements: *None*

---

1. Prove that if $a \leq b$ and $c \leq d$ then $a + c \leq b + d$..

   Proof. Assume $a \leq b$ and $c \leq d$.
   Then

   Adding c to both sides of $a \leq b$ gives: $a + c \leq b + c$. (AP)
   Adding b to both sides of $c \leq d$ gives: $b + c \leq b + d$. (AP)

   Since $a + c \leq b + c$ and $b + c \leq b + d$, then we can conclude $a + c \leq b + d$ by the transitive property.

   □