

Math 4420 HW 1 - Due Tuesday, Feb. 4, 2020

1. Problem 19A (ii) of the text.
2. Let $(\mathbf{P}, \mathcal{B})$ be a $S_\lambda(t, k, v)$ design. Suppose $x \notin \mathbf{P}$. Define a new incidence structure $(\mathbf{P}', \mathcal{B}')$ by $\mathbf{P}' = \mathbf{P} \cup \{x\}$ and $\mathcal{B}' = \{B \cup \{x\} : B \in \mathcal{B}\}$. When is $(\mathbf{P}', \mathcal{B}')$ a combinatorial design?
3. Problem 19B of the text.
4. Problem 19C of the text.
5. Prove that any $S(2, 3, 7)$ -design is isomorphic to the Fano plane (Figure 19.2).