

MATH 1500

Section 6.1 HW Solutions: 2, 11, 13, 15, 19, 20

2. a.  $\{M, I, S, P\}$

b.  $\{I\}$

11. a. No;  $E \cap F = \{2\}$

b. Yes;  $F \cap G = \emptyset$

13. All combinations of members of  $S: \emptyset, \{a\}, \{b\}, \{c\}, \{a, b\}, \{a, c\}, \{b, c\}, S$

15. Yes;  $(E \cup F) \cap (E' \cap F') = \{1, 2, 3\} \cap \{4\} = \emptyset$

19. a. No; there are blue-eyed people at least 18 years old.

b. Yes; a brown-eyed person younger than 18 doesn't have blue eyes.

c. Yes; a brown-eyed person younger than 18 is not at least 18 years old.

20. a.  $E \cup F =$  "blue eyes or at least 18 years old"

b.  $E \cap G = \emptyset$

c.  $E' =$  "not blue eyes"

d.  $F' =$  "younger than 18 years old"

e.  $(G \cup F) \cap E = (G \cap E) \cup (F \cap E)$   
 $= \emptyset \cup (F \cap E)$   
 $= F \cap E$   
 $=$  "blue eyes and at least 18"

f.  $G' \cap E = E =$  "blue eyes"