MATH 110 - EXAM 1 - SOLUTIONS

1. (a) $X = D' \cap S$ //

(b) Applicants who have not received speeding tickets but (or and) who have either caused an accident or been arrested for drunk driving (or both). //

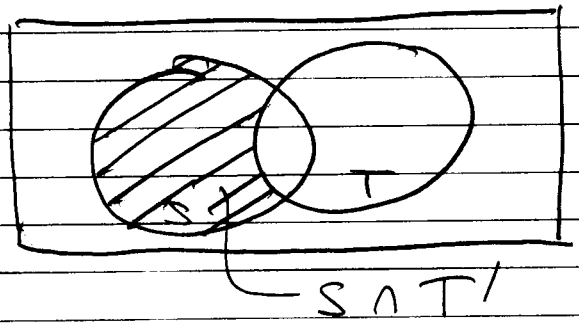
2. (a) $n(S \cup T) = n(S) + n(T) - n(S \cap T)$

$25 = 18 + 10 - n(S \cap T)$

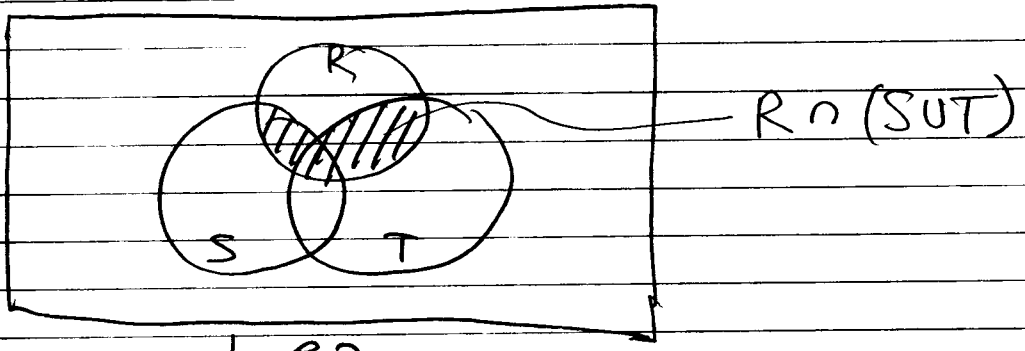
$25 = 28 - n(S \cap T)$

$n(S \cap T) = 3$ //

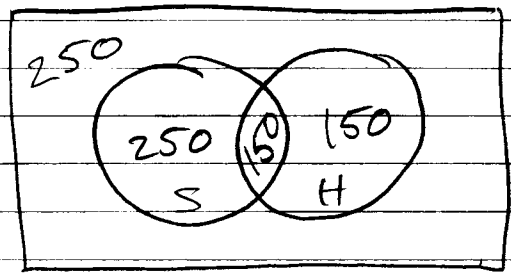
(b)



(c)



3. (a)



S = {students who ski}

H = {students who played ice hockey}

(b) $250 + 150 + 150 = 550$ students in S ∪ H

(c) $250 + 150 = 400$ students participated in exactly one sport.

4. $4^5 = 1024$

5. (a) $\binom{50}{3} = \frac{50 \cdot 49 \cdot 48}{3 \cdot 2} = 19600$

(b) $P(50,3) = 50 \cdot 49 \cdot 48 = 117600$

6. (a) $\binom{12}{7} = \frac{12 \cdot 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7 \cdot 6}{7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2} = 792$

(b) $\binom{12}{4} \cdot \binom{8}{3} \cdot \binom{5}{5} = \frac{12 \cdot 11 \cdot 10 \cdot 9}{4 \cdot 3 \cdot 2} \cdot \frac{8 \cdot 7 \cdot 6}{3 \cdot 2} = 27720$