TS.11 a) $P(A) = \frac{27}{48} = .5625$

b) $P(A \cup B) = \frac{27}{48} + \frac{1}{6} - \frac{5}{48} = .625$

c) Is $P(A|B) = P(A)$?

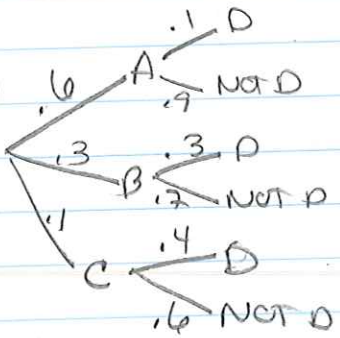
$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{5/48}{1/6} = .625$

$P(A) = \frac{27}{48} = .5625$

$P(A|B) \neq P(A)$ ∴ NO - not independent

TS.12

a)



b) $P(D) = P(D \cap A) + P(D \cap B) + P(D \cap C)$
$= (.1)(.6) + (.3)(.3) + (.4)(.1)$
$= .19$

c) $P(A|D) = \frac{P(A \cap D)}{P(D)} = \frac{(.1)(.6)}{.19} = .316$

$P(B|D) = \frac{P(B \cap D)}{P(D)} = \frac{(.3)(.3)}{.19} = .474$

$P(C|D) = \frac{P(C \cap D)}{P(D)} = \frac{(.4)(.1)}{.19} = .211$

Machine B is most likely to have produced the defective part b/c probability that machine B produced a randomly selected defective part is 47.4% which is higher than machine A (31.6%) and machine C (21.1%).

T5.13 Let S = smoke, C = gets cancer

$P(S) = .25$
$P(S \cap C) = .08$
$P(S^c \cap C^c) = .71$

	S	S^c	total
C	.08	.04	.12
C^c	.17	.71	.88
total	.25	.75	1

a) $P(C|S) = \frac{.08}{.25} = .32$

b) $P(S \cup C) = P(S) + P(C) - P(S \cap C)$
$= .25 + .12 - .08$
$= .29$

c) $P(\text{at least one}) = 1 - P(\text{none})$
$= 1 - (.88)^2$
$= .2256$

T5.14

a) State: How many vehicles pass through until two w/ out-of-state plates pass?
Plan: Let 00-16 be cars w/ out-of-state plates and 17-99 be cars w/o out-of-state plates. Using a random digit table, select two digit numbers starting at a random line. Record how many selections are made until two #s from 00-16 are selected.
Do: Repeat 3 x
trial 1: 3
trial 2:
State: In the three trials, 3 cars, 14 cars, and 13 cars passed until 2 out-of-state cars passed.