

MCS 358 MATH MODEL BUILDING

Problem on probabilities and conditional probabilities of unions, intersections, and complements: ANSWERS

Assume that A and B are events with $P(A) = 0.30$ and $P(B) = 0.20$. Calculate the following probabilities and conditional probabilities for each of the given information situations.

GIVEN INFORMATION		$P(A \cup B)$	$P(A \cap B)$	$P(\bar{A} \cup \bar{B})$	$P(A B)$	$P(\bar{A} B)$
A and B are disjoint.		0.50	0	1	0	1
A and B are independent.		0.44	0.06	0.94	0.30	0.70
$P(A \cap B) = 0.10$.		0.40	0.10	0.90	0.50	0.50
$P(A \cup B) = 0.45$.		0.45	0.05	0.95	0.25	0.75
$P(A B) = 0.40$.		0.42	0.08	0.92	0.40	0.60
$P(B A) = 0.50$.		0.35	0.15	0.85	0.75	0.25
Nothing is known about how A and B are related. (Give min and max values.)	Min	0.30	0	0.80	0	0
	Max	0.50	0.20	1	1	1