

Key

MA114
Spring 2005
Test 2

Form A

1. A pair of dice, one red and one green, is rolled. What is the probability

$$n(S) = 36$$

7pts

a) the sum of the two numbers is 9? $E = \{(3,6), (6,3), (4,5), (5,4)\}$

$$P(\text{sum} = 9) = \frac{4}{36} = \boxed{\frac{1}{9}}$$

7pts

b) the sum is 9 if you know that the red die is a 4?

$$P(\text{sum} = 9 \mid \text{red} = 4) = \frac{P(\text{sum} = 9 \text{ and red} = 4)}{P(\text{red} = 4)} = \frac{1/36}{6/36} = \boxed{\frac{1}{6}}$$

2. Suppose A and B are independent events with $P(A) = .4$ and $P(B) = .6$. Find each of the following.

4pts

$$a) P(A \cap B) = (.4)(.6) = \boxed{.24}$$

4pts

$$b) P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{.24}{.6} = \boxed{.4}$$

4pts

$$c) P(A \cup B) = P(A) + P(B) - P(A \cap B) = .4 + .6 - .24 = \boxed{.76}$$

4pts

$$d) P(A|B^c) = \frac{P(A \cap B^c)}{P(B^c)} = \frac{.16}{.4} = \boxed{.4}$$

