Mathematics 174

Quiz # 22 Name: Key

You must show your work to get full credit.

We roll two six sided dice, one red and one blue and record the outcome as a pair (r, b) where r is value that came up on the red die and b is the value that came up on the blue die. Thus the sample space is the set of all possible out comes:

$$S = \left\{ \begin{array}{cccccc} (1,6) & (2,6) & (3,6) & (4,6) & (5,6) & (6,6) \\ (1,5) & (2,5) & (3,5) & (4,5) & (5,5) & (6,5) \\ (1,4) & (2,4) & (3,4) & (4,4) & (5,4) & (6,4) \\ (1,3) & (2,3) & (3,3) & (4,3) & (5,3) & (6,3) \\ (1,2) & (2,2) & (3,2) & (4,2) & (5,2) & (6,2) \\ (1,1) & (2,1) & (3,1) & (4,1) & (5,1) & (6,1) \end{array} \right\}.$$

1. What is the size of the sample space S? $N(S) =$ $6 \cdot 6 = 36$

2. Let E be the set of elements of S where the sum is 10. List the element of E.
$E =$ $\{(4,6), (5,5), (6,4)\}$

3. What is the probability that the sum is 10? $P(\text{sum is } 10) =$ $\frac{1}{12}$

Prob $= \frac{\#\text{ favorable}}{\text{total number}} = \frac{3}{36} = \frac{1}{12}$

4. What is the probability that both dice show the same value? $P(\text{values are the same}) =$ $\frac{1}{6}$

Favorable out comes are $\{(1,1), (2,2), (3,3), (4,4), (5,5), (6,6)\}$

so 6 favorable out comes.

Prob $= \frac{6}{36} = \frac{1}{6}$