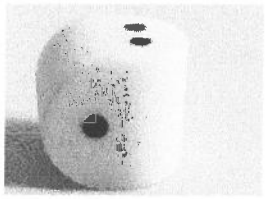
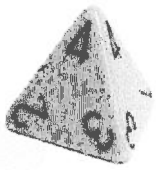
Mathematics 172

Quiz 31 Name: Key

You must show your work to get full credit.

We a four sided die, with sides numbered 1 to 4, twice.





Two ways to make a four sided die.

1. What is the sample space:

$S =$ { (1,1), (1,2), (1,3), (1,4); (2,1), (2,2), (2,3), (2,4); (3,1), (3,2), (3,3), (3,4); (4,1), (4,2), (4,3), (4,4) } size of $S = 16$

2. Let E be the event "the sum is 5". Write out E explicitly: $E =$ {(1,4), (2,3), (3,2), (4,1)}

3. Assume that all the outcomes are equally likely, what are the following probabilities

$P(\text{The sum is } 5) =$ $\frac{4}{16} = \frac{1}{4}$

$P(\text{The first roll is even and the sum is } 5) =$ $\frac{2}{16} = \frac{1}{8}$

This is the event {(2,3), (4,1)}

$P(\text{The first roll is even} \mid \text{the sum is } 5) =$ $\frac{2}{4} = \frac{1}{2}$

(That is what is the probability the first roll is even, given that the sum is 5. One way to think about this is to list the new sample space.)

New sample space = {sum is 5} has size 4