Honors – Algebra 2
Notes #2 – Simple Probability and Two – Way Tables

Three Green and One _____

Date _____ **Period** _____

If all possible outcomes are equally likely, then the probability that a specific *event* happens is…

$$P(\text{event}) = \frac{\text{number of favorable outcomes}}{\text{total number of possible outcomes}}$$

Ex 1.] Suppose we have a fair die, numbered 1 – 6. Let X = the number we roll on the die. Find the following probabilities. Assume we roll the die once.

a.] P(X=2)

b.] P(X = 2 or 3)

c.] P(X > 3)

d.] P(X ≤ 4)

e.] P(X is odd)

f.] P(X is even or 5)

Ex 2.] Suppose we have a bag containing 25 marbles that are all identical except for color. We have 10 Blue, 5 Green, 4 Yellow, and 6 Red marbles. Assume we pick one marble out of the bag. Find the following probabilities.

a.] P(Blue)

b.] P(Yellow)

c.] P(Black)

d.] P(Red or Green)

e.] P(Blue or Yellow)

f.] P(not Blue)

g.] P(Blue or Green or Yellow or Red)

h.] P(Blue or Not Green)

If two events (A and B) are Independent (one outcome does not affect the other), the probability that both events occur is equal to the product of their individual probabilities (multiply).

If A and B are Independent…

$$P(\text{A and B}) = P(\text{A}) \cdot P(\text{B})$$

Ex 3.] Suppose we have two fair dice, a blue one and a red one, both numbered 1-6. Find the following probabilities.

a.] P(Blue is 4) b.] P(Red is 2) c.] P(Blue is 4 and Red is 2)

d.] P(Blue is odd and Red is 5) e.] P(Both are less than 3) f.] P(Red is 5 and blue is NOT 5)

Ex 4.] Suppose we have a bag containing 25 marbles that are all identical except for color. We have 10 Blue, 5 Green, 4 Yellow, and 6 Red marbles. Assume we pick one marble out of the bag, REPLACE IT, and pick another. Find…

a.] P(Blue then Green) b.] P(Blue then NOT Blue) c.] P(Red then Blue or Yellow)

d.] P(Red then Red) e.] P(Red then SAME Red) f.] P(Red then Red then Blue)

If two events are NOT Independent (the outcome of one event affects the other), then we cannot multiply their separate probabilities. We can, however, use a concept from counting principle to figure out what to multiply.

Ex 5.] Suppose we have a bag containing 25 marbles that are all identical except for color. We have 10 Blue, 5 Green, 4 Yellow, and 6 Red marbles. We pick one marble out of the bag, do NOT replace it, and pick another. Find...

a.] P(Blue then Green)

b.] P(Blue then NOT Blue)

c.] P(Red then Blue or Yellow)

d.] P(Red then Red)

e.] P(Red then SAME Red)

f.] P(Red then Red then Blue)