Multiplying Probabilities

1. A coin is tossed twice. What is the probability of obtaining two tails?

1st · 2nd

$\frac{1}{2} \cdot \frac{1}{2} = \boxed{\frac{1}{4}}$

2. A coin is tossed and a die is rolled. What is the probability of obtaining an even number on the die and a head on the coin?

Coin · Die 1 (2) 3 (4) 5 (6)

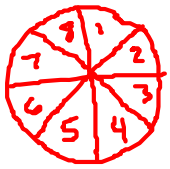
$\frac{1}{2} \cdot \frac{3}{6} = \frac{1}{2} \cdot \frac{1}{2} = \boxed{\frac{1}{4}}$

3. Each question on a six-question multiple choice quiz has 3 incorrect answers and 1 correct answer. If a student guesses on all 6 questions, what is the probability that the student guessed correctly on all six questions?

1st · 2nd · 3rd · 4th · 5th · 6th

$\frac{1}{4} \cdot \frac{1}{4} \cdot \frac{1}{4} \cdot \frac{1}{4} \cdot \frac{1}{4} \cdot \frac{1}{4} = \boxed{\frac{1}{4096}}$

4. A spinner contains 8 equal regions numbered 1 through 8. If the spinner is spun twice, find the probability of each.



a) The spinner lands on an even number and then a prime number.

Even · Prime
2,4,6,8 2,3,5,7

$\frac{4}{8} \cdot \frac{4}{8}$

$\frac{1}{2} \cdot \frac{1}{2} = \boxed{\frac{1}{4}}$

b) The spinner lands on the number 4 twice.

1st 4 · 2nd 4

$\frac{1}{8} \cdot \frac{1}{8}$

$\boxed{\frac{1}{64}}$

5. An urn contains 4 orange marbles and 2 green marbles. A marble is drawn at random and not replaced. A second marble is then drawn from the urn. Find the probability of each.

4 orange 2 green Total = 6
3 orange 2 green Total = 5

a) Both marbles are orange.

1st orange · 2nd orange

$\frac{4}{2\cancel{6}} \cdot \frac{\cancel{4}3}{5}$

$\frac{2\cancel{4}}{5\cancel{10}} = \boxed{\frac{2}{5}}$

b) Both marbles are green.

4 orange 2 green T=6
4 orange 1 green T=5

1st green · 2nd green

$\frac{1\cancel{2}}{3\cancel{6}} \cdot \frac{1}{5} = \boxed{\frac{1}{15}}$

c) Both marbles are the same color.

Both orange OR Both Green

$3 \cdot \frac{2}{3 \cdot 5}$ + $\frac{1}{15} = \frac{6}{15} + \frac{1}{15} = \boxed{\frac{7}{15}}$

LCD = 15