Name: _____ Date: Key

Independent and Dependent Events

1. A bag contains 5 red, 3 green, 4 blue, and 8 yellow marbles. Find the probability of randomly selecting a green marble, and then a yellow marble if the first marble is replaced.

3/50

total marbles = 20

$\frac{3}{20} \cdot \frac{8}{20} = \frac{24}{400} = \boxed{3/50}$

2. A sock drawer contains 5 pairs of each color socks: white, green and blue. What is the probability of randomly selecting a pair of blue socks, replacing it, and then randomly selecting a pair of white socks?

$\frac{1}{9}$

Total Socks = 15

$\frac{5}{15} \cdot \frac{5}{15} = \frac{25}{225} = \boxed{\frac{1}{9}}$

3. In a standard deck of cards, what is the probability of picking a diamond and then another diamond without replacement?

$\frac{1}{17}$

$\frac{13}{52} \cdot \frac{12}{51} = \boxed{\frac{1}{17}}$

4. Randy has 4 pennies, 2 nickles, and 3 dimes in his pocket. If he randomly chooses 2 coins, what is the probability that they are both dimes if he doesn't replace the first one?

$\frac{1}{12}$

total coins: 9

$\frac{3}{9} \cdot \frac{2}{8} = \frac{6}{72} = \boxed{\frac{1}{12}}$

5. Two students are chosen at random from a class of 30. What is the probability that both you and your friend are chosen?

$\frac{1}{435}$

$\frac{2}{30} \cdot \frac{1}{29} = \frac{2}{870} = \boxed{\frac{1}{435}}$

6. A test includes several multiple choice questions, each with 5 choices. Suppose you don't know the answers for three of these questions, so you guess. What is the probability of getting all three correct?

$\frac{1}{125}$

$\frac{1}{5} \cdot \frac{1}{5} \cdot \frac{1}{5} = \boxed{\frac{1}{125}}$

7. Using the letters in the state ARKANSAS. Find the probability of picking an **S** and then an **A** without replacement.

$\frac{3}{28}$

$\frac{2}{8} \cdot \frac{3}{7} = \frac{6}{56} = \boxed{\frac{3}{28}}$

8. Using the letters in the state ARKANSAS. Find the probability of picking a **K** and then a **N** without replacement.

$\frac{1}{56}$

$\frac{1}{8} \cdot \frac{1}{7} = \boxed{\frac{1}{56}}$

9. Using the letters in the state ARKANSAS. Find the probability of picking a **R** and then a **S** without replacement.

$\frac{1}{28}$

$\frac{1}{8} \cdot \frac{2}{7} = \frac{2}{56} = \boxed{\frac{1}{28}}$

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Determining if 2 Events are Independent

Check the following events and determine if they are independent. $P(A \cap B) = P(A) \bullet P(B)$

10. $P(A) = 0.45$ $P(B) = 0.30$ $P(A \cap B) = 0.75$

Conclusion: Not independent
The events are dependent.

Check your calculations here.
Show ALL work.

$P(A \cap B) = P(A) \cdot P(B)$

$.75 \stackrel{?}{=} .45 \cdot .30$

$.75 \neq .135$

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11. $P(A) = 0.12$ $P(B) = 0.56$ $P(A \cap B) = 0.0672$

Conclusion: The events are independent.

Check your calculations here.
Show ALL work.

$P(A \cap B) = P(A) \cdot P(B)$

$.0672 \stackrel{?}{=} .12 \cdot .56$

$.0672 = .0672$ ✓

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12. $P(A) = \frac{4}{5}$ $P(B) = \frac{3}{8}$ $P(A \cap B) = \frac{7}{40}$

Conclusion: Not independent
The events are dependent.

Check your calculations here.
Show ALL work.

$P(A \cap B) = P(A) \cdot P(B)$

$\frac{7}{40} \stackrel{?}{=} \frac{4}{5} \cdot \frac{3}{8}$

$\frac{7}{40} \neq \frac{12}{40}$

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13. $P(A) = \frac{7}{9}$ $P(B) = \frac{3}{4}$ $P(A \cap B) = \frac{7}{12}$

Conclusion: The events are independent.

Check your calculations here.
Show ALL work.

$P(A \cap B) = P(A) \cdot P(B)$

$\frac{7}{12} \stackrel{?}{=} \frac{7}{9} \cdot \frac{3}{4}$

$\frac{7}{12} = \frac{21}{36} = \frac{7}{12}$ ✓

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