

DON'T FORGET: Events are **Independent** if and only if $P(A) \cdot P(B) = P(A \cap B)$

Formula for **Union** of Events: $P(A \text{ or } B) = P(A) + P(B) - P(A \cap B)$

PROBABILITY REGENTS PRACTICE:

1. A fast-food restaurant analyzes data better to serve its customers. After its analysis, it discovered that the events D, that a customer uses the drive-thru, and F, that a customer orders French fries, are independent. The following data are given in a report.

$$P(F) = 0.8$$

$$P(F \cap D) = 0.456$$

Given this information, $P(F/D)$ is

(1) 0.344 (3) 0.3648

(2) 0.57 (4) 0.8

2. On a given school day, the probability that Nick oversleeps is 48% and the probability he has a pop quiz is 25%. Assuming these two events are independent, what is the probability that Nick oversleeps and has a pop quiz on the same day?

(1) 73% (3) 23%

(2) 36% (4) 12%

3. Sean's team has a baseball game tomorrow. He pitches 50% of the games. There is a 40% chance of rain during the game tomorrow. If the probability that it rains given that Sean pitches is 40%, it can be concluded that these two events are

(1) independent (3) mutually exclusive

(2) dependent (4) complements

4. The probability that Gary and Jane have a child with blue eyes is 0.25, and the probability that they have a child with blond hair is 0.5. The probability that they have a child with both blue eyes and blond hair is 0.125. Given this information, the events blue eyes and blond hair are

I: dependent

II: independent

III: mutually exclusive

(1) *I*, only (3) *I* and *III*

(2) *II*, only (4) *II* and *III*

5. Given events A and B , such that $P(A) = 0.6$, $P(B) = 0.5$, and $P(A \cup B) = 0.8$, determine whether A and B are independent or dependent.

6. The results of a survey of the student body at Central High School about television viewing preferences are shown below.

	Comedy Series	Drama Series	Reality Series	Total
Males	95	65	70	230
Females	80	70	110	260
Total	175	135	180	490

Are the events “student is a male” and “student prefers reality series” independent of each other? Justify your answer.

CHALLENGE: A student is chosen at random from the student body at a given high school. The probability that the student selects Math as a favorite subject is $\frac{1}{4}$. The probability that the student chosen is a junior is $\frac{116}{459}$.

- (a) If the probability that the student selected is a junior or that the student chooses Math as the favorite subject is $\frac{47}{108}$, what is the exact probability that the student selected is a junior whose favorite subject is Math?
- (b) Are the events “the student is a junior” and “the student’s favorite subject is Math” independent of each other? Explain your answer.