

KEY

PROBABILITY NOTATION EXERCISES

A class of freshmen (F), sophomores (O), juniors (J), and seniors (S) was surveyed concerning the classes they are taking (math (M), English (E) or history (H)).

For the following, write the correct mathematical notation for the probability you are finding using the variables above, as you will not be able to determine the numerical answers.

- (a) What is the probability that a randomly selected student is a junior, given that he/she is taking English?

$$P(J|E)$$

- (b) What is the probability that a randomly selected student is a freshman taking math?

$$P(F \cap M)$$

- (c) What is the probability that a randomly selected math student is a senior?

$$P(S|M)$$

- (d) What is the probability that a randomly selected student is a sophomore or is taking English?

$$P(O \cup E) = P(O) + P(E) - P(O \cap E)$$

- (e) What is the probability that a randomly selected junior is taking history?

$$P(H|J)$$

- (f) What is the probability that a randomly selected history student is also a math student?

$$P(M|H)$$

- (g) What is the probability that a randomly selected student is taking math, if it is known that the student is a junior or a senior?

$$P(M|J \cup S)$$

- (h) What is the probability that a randomly selected student is a sophomore, but is not taking history?

$$P(O \cap H^c)$$

- (i) What is the probability that a randomly selected sophomore is taking math or history?

$$P(M \cup H | O)$$

- (j) What is the probability that a randomly selected history and math student is a junior?

$$P(J | H \cap M)$$

- (k) What is the probability that a randomly selected English and math student is also taking history?

$$P(H | E \cap M)$$

- (l) What is the probability that a randomly selected senior is taking all three classes?

$$P(E \cap M \cap H | S)$$

- (m) What is the probability that a randomly selected student is taking exactly one of these classes?

$$P((E \cap M^c \cap H^c) \cup (E^c \cap M \cap H^c) \cup (E^c \cap M^c \cap H))$$

- (n) What is the probability that a randomly selected freshman is not taking any of these classes?

$$P((M \cup E \cup H)^c | F)$$