1. You are rolling a fair, six-sided die.
Let E = the event that it lands on an even number.
Let M = the event that it lands on a multiple of three.

What does $P(E \cap M)$ mean in words?

A. $P(E \cap M)$ is the probability of rolling an even number or a multiple of 3.

B. $P(E \cap M)$ is the probability of rolling an even number and a multiple of 3.

C. $P(E \cap M)$ is the probability of rolling a multiple of 3 given that the number is even.

D. $P(E \cap M)$ is the probability of rolling an even number which is not a multiple of 3.

E. $P(E \cap M)$ is the probability of rolling an even number given that the number is a multiple of 3.

2. A fair, six-sided die is rolled. The sample space S is all possible outcomes in the set $\{1, 2, 3, 4, 5, 6\}$. Identify the following events with a subset of S and compute its probability (an outcome is the number of dots that show up). Let be the sample space where every element has an equal chance of being chosen.
Event N = the outcome is 2.
Event A = the outcome is an odd number.
Event B = the outcome is greater than 4.

Identify the subset of S which corresponds to the event $A \cup B$ and find $P(A \cup B)$.

A. $A \cup B = \{5\}$ and $P(A \cup B) = \frac{5}{6}$.

B. $A \cup B = \{1, 2, 3, 4\}$ and $P(A \cup B) = \frac{5}{6}$.

C. $A \cup B = \{5\}$ and $P(A \cup B) = \frac{2}{3}$.

D. $A \cup B = \{1, 3, 5, 6\}$ and $P(A \cup B) = \frac{5}{6}$.

E. $A \cup B = \{5, 6\}$ and $P(A \cup B) = \frac{2}{3}$.

F. $A \cup B = \{5, 6\}$ and $P(A \cup B) = \frac{5}{6}$.

G. $A \cup B = \{1, 3, 5, 6\}$ and $P(A \cup B) = \frac{2}{3}$.

H. $A \cup B = \{1, 2, 3, 4\}$ and $P(A \cup B) = \frac{2}{3}$.

3. A pack of Skittles contains 13 purples, 14 yellows, 10 greens, 11 reds, 10 oranges, and 12 blues. You draw one Skittle from the bag.
Let Pu = the event of drawing a purple Skittle.
Let Y = the event of drawing a yellow Skittle.
Let G = the event of drawing a green Skittle.
Let R = the event of drawing a red Skittle.
Let Or = the event of drawing a orange Skittle.
Let B = the event of drawing a blue Skittle.

Find the probability $P(Pu)$.

A. $P(Pu) = \frac{3}{14}$

B. $P(Pu) = \frac{9}{70}$

C. $P(Pu) = \frac{13}{70}$

D. $P(Pu) = \frac{9}{35}$

E. $P(Pu) = \frac{11}{69}$

F. $P(Pu) = \frac{16}{69}$

G. $P(Pu) = \frac{4}{23}$

H. $P(Pu) = \frac{17}{69}$

4. In a particular college class, there are male and female students. Some students have long hair and some students have short hair.
Let F be the event that a student is female.
Let M be the event that a student is male.
Let S be the event that a student has short hair.
Let L be the event that a student has long hair.
Write the symbols for the probability that a student is male, given that the student has long hair.

A. $P(S|F)$

B. $P(F \cap L)$

C. $P(F|S)$

D. $P(F|L)$

E. $P(F \cup L)$

F. $P(M \cap S)$

G. $P(M \cup S)$

H. $P(M|L)$

5. A fair, six-sided die is rolled. The sample space S is all possible outcomes in the set $\{1, 2, 3, 4, 5, 6\}$. Identify the following events with a subset of S and compute its probability (an outcome is the number of dots that show up). Let be the sample space where every element has an equal chance of being chosen.
Event N = the outcome is 2.
Event A = the outcome is an even number.
Event B = the outcome is less than 3.

Identify the subset of S which corresponds to the event A and find $P(A)$.

A. $A = \{2, 4, 6\}$ and $P(A) = \frac{1}{3}$.

B. $A = \{1, 3, 5\}$ and $P(A) = \frac{5}{6}$.

C. $A = \{2, 4, 6\}$ and $P(A) = \frac{5}{6}$.

D. $A = \{1, 3, 5\}$ and $P(A) = \frac{1}{2}$.

E. $A = \{1, 3, 5\}$ and $P(A) = \frac{1}{3}$.

F. $A = \{2, 4, 6\}$ and $P(A) = \frac{1}{6}$.

G. $A = \{2, 4, 6\}$ and $P(A) = \frac{1}{2}$.

H. $A = \{1, 3, 5\}$ and $P(A) = \frac{1}{6}$.

6. Let $S = \{0, \diamondsuit, \natural, \sharp, 3, 8, \clubsuit, \bigstar, \spadesuit, 2, \blacksquare, 9, 1, 5, 4, \heartsuit, \flat, \blacktriangle, 6, 7\}$ be the sample space where every element has an equal chance of being chosen.

Consider the two events $A = \{0, \sharp, 8, 2, 5, \blacktriangle, 7\}$ and $B = \{0, \natural, 3, 9, 1, 6, 7\}$.

Find the probability $P(A|B)$ and $P(B|A)$.

A. $P(A|B) = \frac{1}{7}$ and $P(B|A) = \frac{5}{7}$

B. $P(A|B) = 0$ and $P(B|A) = \frac{1}{7}$

C. $P(A|B) = \frac{2}{7}$ and $P(B|A) = \frac{5}{7}$

D. $P(A|B) = 0$ and $P(B|A) = 0$

E. $P(A|B) = \frac{2}{7}$ and $P(B|A) = 0$

F. $P(A|B) = \frac{2}{7}$ and $P(B|A) = \frac{2}{7}$

G. $P(A|B) = \frac{1}{7}$ and $P(B|A) = \frac{1}{7}$

H. $P(A|B) = \frac{1}{7}$ and $P(B|A) = \frac{2}{7}$

7. Let $S = \{6, \bigstar, \spadesuit, \diamondsuit, 3, 9, 1, \blacktriangle, 7, 8, \natural, \clubsuit, 2, 4, \blacksquare, \flat, 5, \sharp, 0, \heartsuit\}$ be the sample space where every element has an equal chance of being chosen.

Consider the event $A = \{\bigstar, \diamondsuit, 3, 9, 1, 7, 0\}$. Find the event A'.

A. $A' = \{6, \blacktriangle, 7, 8, \natural, 2, 4, \blacksquare, \flat, \sharp, 0, \heartsuit\}$

B. $A' = \{\diamondsuit, 1, 7, 8, \blacksquare, \flat, 5, 0, \heartsuit\}$

C. $A' = \{6, \bigstar, \blacktriangle, 7, \clubsuit, 2, 4, \blacksquare, \flat, 0, \heartsuit\}$

D. $A' = \{6, \bigstar, \diamondsuit, 9, 8, \natural, \flat, \sharp\}$

E. $A' = \{\diamondsuit, 9, 1, 7, \natural, 2, 4, \flat, \sharp, \heartsuit\}$

F. $A' = \{6, \bigstar, \spadesuit, \diamondsuit, 9, 1, \blacktriangle, 7, 8, \clubsuit, 4, \blacksquare, \flat, 5, \sharp, 0, \heartsuit\}$

G. $A' = \{6, \spadesuit, 3, 9, 8, \natural, \clubsuit, 2, 4, \blacksquare, 5, \sharp\}$

H. $A' = \{6, \spadesuit, \blacktriangle, 8, \natural, \clubsuit, 2, 4, \blacksquare, \flat, 5, \sharp, \heartsuit\}$

8. A pack of m&ms contains 13 browns, 11 yellows, 15 greens, 12 reds, 14 oranges, and 11 blues. You draw one m&m from the bag.
Let Br = the event of drawing a brown m&m.
Let Y = the event of drawing a yellow m&m.
Let G = the event of drawing a green m&m.
Let R = the event of drawing a red m&m.
Let Or = the event of drawing a orange m&m.
Let Bl = the event of drawing a blue m&m.

Find the probability $P(R)$.

A. $P(R) = \frac{10}{73}$

B. $P(R) = \frac{4}{19}$

C. $P(R) = \frac{9}{73}$

D. $P(R) = \frac{2}{19}$

E. $P(R) = \frac{7}{38}$

F. $P(R) = \frac{3}{19}$

G. $P(R) = \frac{17}{73}$

H. $P(R) = \frac{11}{73}$