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

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

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

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

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

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

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

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

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 3.
Event A = the outcome is an odd number.
Event B = the outcome is less than 3.
Identify the subset of S which corresponds to the event $A \cup B$ and find $P(A \cup B)$.

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

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

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

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

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

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

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

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

3. 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 has short hair, given that the student is female.

A. $P(F \cap L)$

B. $P(S|F)$

C. $P(F|S)$

D. $P(F \cup L)$

E. $P(L|M)$

F. $P(F|L)$

G. $P(M \cup S)$

H. $P(M \cap S)$

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

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

Find the probability $P(A \cup B)$.

A. $P(A \cup B) = \frac{17}{15}$

B. $P(A \cup B) = \frac{14}{15}$

C. $P(A \cup B) = \frac{11}{13}$

D. $P(A \cup B) = \frac{16}{15}$

E. $P(A \cup B) = \frac{13}{15}$

F. $P(A \cup B) = \frac{18}{13}$

G. $P(A \cup B) = \frac{10}{13}$

H. $P(A \cup B) = \frac{9}{13}$

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 6.
Event A = the outcome is an odd number.
Event B = the outcome is less than 4.
Identify the subset of S which corresponds to the event $A \cap B$ and find $P(A \cap B)$.

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

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

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

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

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

F. $A \cap B = \{1, 3\}$ and $P(A \cap B) = \frac{1}{2}$.

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

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

6. 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 1.
Event A = the outcome is an odd number.
Event B = the outcome is greater than 3.
Identify the subset of S which corresponds to the event N' and find $P(N')$.

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

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

C. $N' = \{1\}$ and $P(N') = \frac{1}{2}$.

D. $N' = \{1\}$ and $P(N') = \frac{1}{3}$.

E. $N' = \{1\}$ and $P(N') = \frac{1}{6}$.

F. $N' = \{2, 3, 4, 5, 6\}$ and $P(N') = \frac{5}{6}$.

G. $N' = \{2, 3, 4, 5, 6\}$ and $P(N') = \frac{1}{6}$.

H. $N' = \{1\}$ and $P(N') = \frac{5}{6}$.

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

Consider the two events $A = \{7, \heartsuit, 0, 6, 2, 4, 1, \blacktriangle, \spadesuit\}$ and $B = \{\clubsuit, 6, 4, \diamondsuit, 9, 1, \blacksquare, \spadesuit\}$.

Find the probability $P(A \cap B)$.

A. $P(A \cap B) = \frac{2}{9}$

B. $P(A \cap B) = \frac{2}{15}$

C. $P(A \cap B) = \frac{1}{15}$

D. $P(A \cap B) = \frac{8}{15}$

E. $P(A \cap B) = \frac{1}{3}$

F. $P(A \cap B) = -\frac{1}{18}$

G. $P(A \cap B) = \frac{1}{2}$

H. $P(A \cap B) = \frac{1}{3}$

8. A pack of m&ms contains 12 browns, 12 yellows, 14 greens, 10 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. $P(R) = \frac{12}{73}$

C. $P(R) = \frac{5}{71}$

D. $P(R) = \frac{14}{73}$

E. $P(R) = \frac{8}{71}$

F. $P(R) = \frac{7}{71}$

G. $P(R) = \frac{11}{71}$

H. $P(R) = \frac{15}{73}$