III. A.

1. The probability that a player wins 5 times in a row is $\frac{1}{243}$.
I calculated the answer by using the Rule of Compound Probability involving *and*.

The probability of winning the shell game 1 time is $\frac{1}{3}$.
Let *W* represent winning the shell game 1 time.

$P(W) = \frac{1}{3}$

$P(W, W, W, W, \text{and } W) = P(W) \cdot P(W) \cdot P(W) \cdot P(W) \cdot P(W)$

$= \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3} \cdot \frac{1}{3}$

$= \frac{1}{243}$

2. The probability of choosing the same student 5 days in a row is $\frac{1}{7{,}962{,}624}$.
I calculated the answer by using the Rule of Compound Probability involving *and*.

The probability of choosing the one particular student is $\frac{1}{24}$.
Let *S* represent choosing a particular student.

$P(S) = \frac{1}{24}$

$P(S, S, S, S, \text{and } S) = P(S) \cdot P(S) \cdot P(S) \cdot P(S) \cdot P(S)$

$= \frac{1}{24} \cdot \frac{1}{24} \cdot \frac{1}{24} \cdot \frac{1}{24} \cdot \frac{1}{24}$

$= \frac{1}{7{,}962{,}624}$

3. The probability that the first two spinners land on 1 is $\frac{1}{24}$.
I calculated the answer by using the Rule of Compound Probability involving *and*.

The probability of the 1st spinner landing on 1 is $\frac{1}{6}$.

$P(1 \text{ on 1st spinner}) = \frac{1}{6}$

The probability of the 2nd spinner landing on 1 is $\frac{1}{4}$.

$P(1 \text{ on 2nd spinner}) = \frac{1}{4}$

The probability of the 3rd spinner landing on any number is $\frac{12}{12}$, or 1.

$P(\text{any number on 3rd spinner}) = 1$

I don't have to include the probability of the 3rd spin in my calculation because multiplying by 1 will not affect the final answer.

$P(1 \text{ on 1st spinner and } 1 \text{ on 2nd spinner}) = P(1 \text{ on 1st spinner}) \cdot P(1 \text{ on 2nd spinner})$

$= \frac{1}{6} \cdot \frac{1}{4}$

$= \frac{1}{24}$

4. The probability of choosing a block labeled W from the second set is $\frac{1}{4}$.

I calculated the answer by using the Rule of Compound Probability involving *and*.

The probability of choosing any block from the first set is $\frac{12}{12}$, or 1.

$P(\text{any block 1st}) = 1$

The probability of choosing a block labeled W from the second set is $\frac{3}{12}$, or $\frac{1}{4}$.

$P(\text{W 2nd}) = \frac{1}{4}$

I don't have to include the probability of any block 1st in my calculation because multiplying by 1 will not affect the final answer. So, the final answer is $P(\text{W 2nd}) = \frac{1}{4}$.

5. The probability of choosing two marbles with stripes is $\frac{7}{34}$.

I calculated the answer by using the Rule of Compound Probability involving *and*.

The probability of choosing a marble with stripes from the 1st set is $\frac{7}{17}$.

Let *A* represent choosing a marble with stripes from the 1st set.

$P(A) = \frac{7}{17}$

The probability of choosing a marble with stripes from the 2nd set is $\frac{9}{18}$, or $\frac{1}{2}$.

Let *B* represent choosing a marble with stripes from the 2nd set.

$P(B) = \frac{1}{2}$

$$P(A \text{ and } B) = P(A) \cdot P(B)$$
$$= \frac{7}{17} \cdot \frac{1}{2}$$
$$= \frac{7}{34}$$

6. The probability that a player wins 5 times in a row is $\frac{1}{9{,}765{,}625}$.

I calculated the answer by using the Rule of Compound Probability involving *and*.

The probability of me or my friend winning the prize 1 time is $\frac{2}{50}$, or $\frac{1}{25}$.

Let *W* represent me or my friend winning the prize 1 time.

$P(W) = \frac{1}{25}$

$$P(W, W, W, W, \text{and } W) = P(W) \cdot P(W) \cdot P(W) \cdot P(W) \cdot P(W)$$
$$= \frac{1}{25} \cdot \frac{1}{25} \cdot \frac{1}{25} \cdot \frac{1}{25} \cdot \frac{1}{25}$$
$$= \frac{1}{9{,}765{,}625}$$

III. B.

1. The probability of choosing a block labeled with a *T* or a block labeled with a 6 is $\frac{11}{32}$.

2. The probability of choosing a rotten apple or a rotten orange is $\frac{41}{432}$.

3. The probability of a one on the 1st roll or a one on the 2nd roll is $\frac{11}{36}$.

4. The probability of landing on a number greater than 9 on the 1st spin or a number less than 6 on the 2nd spin is $\frac{9}{16}$.

5. The probability that the student chosen from the math class or the student chosen from the history class is in the band is $\frac{15}{32}$.

6. The probability of choosing a pyramid from the shaded set or a cylinder from the unshaded set is $\frac{79}{169}$.

III. C.

1. The probability of choosing a 2 first and a 3 second is $\frac{1}{9}$.

2. The probability of choosing a green marble first, a red marble second, and a blue marble third is $\frac{96}{15{,}625}$.

3. The probability of choosing a triangle first or a square second is $\frac{4}{9}$.

4. The probability of choosing an A block first or a D block second is $\frac{29}{64}$.

5. The probability of choosing a quarter first or a dime second is $\frac{49}{121}$.

6. The probability of choosing a green block first, a yellow block second, and a blue block third is $\frac{9}{2662}$.

IV. A.

1. The probability of choosing all 4 aces is $\frac{1}{270{,}725}$.

I calculated the answer by using the Rule of Compound Probability involving *and*.

The probability of choosing an ace first is $\frac{4}{52}$, or $\frac{1}{13}$.

The probability of choosing an ace second is $\frac{3}{51}$, or $\frac{1}{17}$.

The probability of choosing an ace third is $\frac{2}{50}$, or $\frac{1}{25}$.

The probability of choosing an ace fourth is $\frac{1}{49}$.

$$P(\text{ace 1st, ace 2nd, ace 3rd, and ace 4th}) = P(\text{ace 1st}) \cdot P(\text{ace 2nd}) \cdot P(\text{ace 3rd}) \cdot P(\text{ace 4th})$$
$$= \frac{1}{13} \cdot \frac{1}{17} \cdot \frac{1}{25} \cdot \frac{1}{49}$$
$$= \frac{1}{270{,}725}$$

2. The probability that the first two ribbons will be yellow is $\frac{1}{51}$.

I calculated the answer by using the Rule of Compound Probability involving *and*.

The probability of choosing a yellow ribbon 1st is $\frac{3}{18}$, or $\frac{1}{6}$.

The probability of choosing a yellow ribbon 2nd is $\frac{2}{17}$.

The probability of choosing any ribbon 3rd is $\frac{16}{16}$, or 1.

I don't have to include the probability of choosing any ribbon 3rd in my calculation because multiplying by 1 will not affect the final answer.

$P(\text{yellow 1st and yellow 2nd}) = P(\text{yellow 1st}) \cdot P(\text{yellow 2nd})$

$= \frac{1}{6} \cdot \frac{2}{17}$

$= \frac{1}{51}$

3. The probability of choosing 4 discs in alphabetical order is $\frac{9}{1820}$.

I calculated the answer by using the Rule of Compound Probability involving *and*.

The probability of choosing a disc with an A 1st is $\frac{6}{16}$, or $\frac{3}{8}$.

The probability of choosing a disc with a B 2nd is $\frac{3}{15}$, or $\frac{1}{5}$.

The probability of choosing a disc with a C 3rd is $\frac{3}{14}$.

The probability of choosing a disc with a D 4th is $\frac{4}{13}$.

$P(\text{A 1st, B 2nd, C 3rd, and D 4th}) = P(\text{A 1st}) \cdot P(\text{B 2nd}) \cdot P(\text{C 3rd}) \cdot P(\text{D 4th})$

$= \frac{3}{8} \cdot \frac{1}{5} \cdot \frac{3}{14} \cdot \frac{4}{13}$

$= \frac{36}{7280}$

$= \frac{9}{1820}$

4. The probability of Evan choosing a quarter 1st is $\frac{2}{7}$.

I calculated the answer by using the Rule of Compound Probability involving *and*.

The probability of choosing a quarter 1st $\frac{6}{21}$ is , or $\frac{2}{7}$.

The probability of choosing any coin 2nd is $\frac{20}{20}$, or 1.

The probability of choosing any coin 3rd is $\frac{19}{19}$, or 1.

I don't have to include the probability of choosing any coin 2nd or the probability of choosing any coin 3rd in my calculation because multiplying by 1 will not affect the final answer. So, the probability of Evan choosing a quarter 1st is $\frac{2}{7}$.

5. The probability of choosing 4 students with birthdays in June, July, or August is $\frac{2}{325}$.

I calculated the answer by using the Rule of Compound Probability involving "and".

The probability of the 1st student having a birthday in June, July, or August is $\frac{9}{28}$.

The probability of the 2nd student having a birthday in June, July, or August is $\frac{8}{27}$.

The probability of the 3rd student having a birthday in June, July, or August is $\frac{7}{26}$.

The probability of the 4th student having a birthday in June, July, or August is $\frac{6}{25}$.

Let *B* represent choosing a student with a birthday in June, July, or August.

$P(\text{B 1st, B 2nd, B 3rd, and B 4th}) = P(\text{B 1st}) \cdot P(\text{B 2nd}) \cdot P(\text{B 3rd}) \cdot P(\text{B 4th})$

$$= \frac{9}{28} \cdot \frac{8}{27} \cdot \frac{7}{26} \cdot \frac{6}{25}$$

$$= \frac{3024}{491{,}400}$$

$$= \frac{2}{325}$$

6. The probability of the 1st cards not having a 9 as one of its digits and the 2nd and 3rd cards having a 9 as one of their digits is $\frac{41}{7095}$.

I calculated the answer by using the Rule of Compound Probability involving *and*.

The probability that the 1st number does not have a 9 as one of its digits is $\frac{41}{45}$.

The probability that the 2nd number has a 9 as one of its digits is $\frac{4}{44}$.

The probability that the 3rd number has a 9 as one of its digits is $\frac{3}{43}$.

Let *N* represent choosing a card that has a 9 as one of its digits.

$P(\text{not } N \text{ 1st and } N \text{ 2nd and } N \text{ 3rd}) = P(\text{not } N \text{ 1st}) \cdot P(N \text{ 2nd}) \cdot P(N \text{ 3rd})$

$$= \frac{41}{45} \cdot \frac{4}{44} \cdot \frac{3}{43}$$

$$= \frac{492}{85{,}140}$$

$$= \frac{41}{7095}$$

IV. B.

1. The probability of choosing a blue sock first or a green sock second is $\frac{83}{190}$.

2. The probability of choosing a cube with a 2 first or a cube with a 3 second is $\frac{32}{105}$.

3. The probability that I will be chosen first or my friend will be chosen second is $\frac{27}{574}$.

4. The probability that the first ball has stars or the second ball has stripes is $\frac{109}{190}$.

5. The probability of choosing an ace first or a King second is $\frac{98}{663}$.

6. The probability of a favorite song first or a favorite song second is $\frac{94}{325}$.

IV. C.

1. The probability of choosing a pyramid first, cube second, and cylinder third is $\frac{9}{220}$.

2. The probability of choosing a pear first or an orange second is $\frac{29}{66}$.

3. The probability of choosing a white ball first or a shaded ball second is $\frac{11}{15}$.

4. The probability that the first student will draw an A and the second student will draw a B is $\frac{137}{276}$.

5. The probability of choosing a black sock first and a black sock second is $\frac{14}{95}$.

6. The probability of choosing a J block first or a K block second is $\frac{53}{91}$.

7. The probability of choosing a numbered card first or a King second is $\frac{158}{221}$.

8. The probability of choosing a blue t-shirt first and another blue t-shirt second is $\frac{1}{11}$.