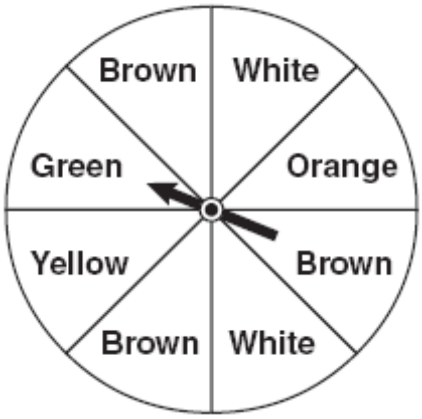
A.S.23: Calculate the probability of a series of independent events, a series of dependent events, two mutually exclusive events, two events that are not mutually exclusive.

1. 010928ia, P.I. A.S.23
Keisha is playing a game using a wheel divided into eight equal sectors, as shown in the diagram below. Each time the spinner lands on orange, she will win a prize.



If Keisha spins this wheel twice, what is the probability she will win a prize on *both* spins?

[A] $\frac{1}{16}$ [B] $\frac{1}{56}$ [C] $\frac{1}{64}$ [D] $\frac{1}{4}$

2. 080832ia, P.I. A.S.23
Brianna is using the two spinners shown below to play her new board game. She spins the arrow on each spinner once. Brianna uses the first spinner to determine how many spaces to move. She uses the second spinner to determine whether her move from the first spinner will be forward or backward.

Find the probability that Brianna will move *fewer than* four spaces and *backward*.

3. fall0702ia, P.I. A.S.23
Throughout history, many people have contributed to the development of mathematics. These mathematicians include Pythagoras, Euclid, Hypatia, Euler, Einstein, Agnesi, Fibonacci, and Pascal. What is the probability that a mathematician's name selected at random from those listed will start with either the letter E or the letter A?

[A] $\frac{6}{8}$ [B] $\frac{3}{8}$ [C] $\frac{4}{8}$ [D] $\frac{2}{8}$

4. 080830ia, P.I. A.S.23
The faces of a cube are numbered from 1 to 6. If the cube is tossed once, what is the probability that a prime number or a number divisible by 2 is obtained?

[A] $\frac{6}{6}$ [B] $\frac{1}{6}$ [C] $\frac{4}{6}$ [D] $\frac{5}{6}$

[1] C

[2] $\frac{3}{8}$ or 0.375, and appropriate work is shown.
[1] Appropriate work is shown, but the answer is rounded.
or [1] Appropriate work is shown, but one computational error is made.
or [1] Appropriate work is shown, but one conceptual error is made.
or [1] $\frac{3}{8}$, but no work is shown.
[0] A zero response is completely incorrect, irrelevant, or incoherent or is a correct response that was obtained by an obviously incorrect procedure.
[2]

[3] C

[4] D