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## Include all necessary math work or explanations for each question.

## Questions 1-2: Answer each part of the question.

1) A standard six sided number cube is rolled.
a. What is the sample space?
b. Is each roll independent of the next? Explain.
c. What is the probability of rolling a number greater than 2 on a number cube?
2) Two standard number cubes are rolled. (Remember: The sum is the result of adding 2 numbers together. The product is the result of multiplying two numbers together.)
a. What is the sample space?
b. Find $P($ a sum equal to 2$)$
c. Find P (sum not equal to 2 )
d. $P(a$ sum greater than 6$)$
e. $P($ a product less than or equal to 2 )
f. $\quad P(a$ sum equal to 12$)$

Questions 3-7: Determine if the events are independent or dependent.
3) You roll a 2 on a number cube and spin a 3 on a spinner.
4) You choose a King from a deck of cards and get heads in a coin toss.
5) You roll a number cube and get a 6, and roll again if the first roll is a 6 .
6) There's a $64 \%$ chance of it raining in Illinois on Wednesday and there's a $52 \%$ of it snowing in Connecticut on Friday. If there's a $33.28 \%$ chance of both occurring, are these events independent? Explain.
7) Mr. Wilmer polled a class of 30 students about the preference in TV shows. 24 students said they enjoyed watching comedy shows and 12 said they enjoyed watching action shows. If it was determined that 9 enjoyed watching both comedy and action showed, are they two events independent? Explain.
8) A bag contains 1 red marble, 3 green marbles, 1 blue marble, and 1 yellow marble. Suppose one marble is picked at random.
a. What is the sample space?
c. Find P (green)
d. Find $P$ (not red)
b. Find $P$ (blue)
e. Find $P$ (not yellow)
9) A coin is tossed 30 times and lands on heads 17 times. What is the experimental probability of the coin landing on tails?
10) What is the theoretical probability of randomly choosing a science book from a shelf that holds 3 mystery books, 5 science books, and 4 nature books?
11) What is the theoretical probability of rolling a multiple of 3 on a standard number cube? For 60 rolls of the number cube, predict the number of rolls that will result in a multiple of 3 . Will the experimental probability be the same?
12) A game is played where students throw beanbags at the target shown to the right. Each region of the target is the same size and every beanbag hits the target. For one game, section A was hit 6 times, section B 3 times, section C 8 times, and section D 5 times.
a. What is the experimental probability of hitting section $D$ ?

b. What is the theoretical probability of hitting section $D$ ?
13) A spinner has 4 equal sections. After 12 spins, the spinner landed on section A 4 times, section B 5 times, section C 2 times, and section D 1 time.
a. What is the experimental probability of the spinner stopping on section $A$ ?
b. What is the theoretical probability of the spinner stopping on section $A$ ?

14) You and a friend flip a coin 10 times. The coin lands on heads 7 times. Your friend says that the theoretical probability of getting heads is $\frac{7}{10}$. What error did your friend make? What is the correct value for theoretical probability? Explain.

