

# MOMENTUM MATH LEVEL G



## TABLE OF CONTENTS

### Unit 6—Probability

<b>Lesson A:</b> Theoretical Probability . . . . .	501
<i>How do you find the likelihood of an event without doing an experiment?</i>	
<b>Lesson B:</b> Experimental Probability . . . . .	511
<i>How does experimental probability differ from theoretical probability?</i>	
<b>Lesson C:</b> Representing Probabilities . . . . .	521
<i>In what ways can probabilities be represented?</i>	
<b>Lesson D:</b> Complementary Events . . . . .	531
<i>What are complementary events?</i>	
<b>Lesson E:</b> Making Predictions . . . . .	541
<i>How do you use probability to make predictions?</i>	
<b>Lesson F:</b> Independent Compound Events . . . . .	551
<i>How can you find the probability of independent compound events?</i>	
<b>Lesson G:</b> Dependent Compound Events . . . . .	561
<i>How can you find the probability of dependent compound events?</i>	
<b>Lesson H:</b> Applications of Compound Events . . . . .	571
<i>How can you find the probability of real-world compound events?</i>	
<b>Lesson I:</b> The Fundamental Counting Principle . . . . .	581
<i>How can you find the total number of combinations of events?</i>	
<b>Lesson J:</b> Combinations and Permutations . . . . .	591
<i>How can you find combinations and permutations of different objects?</i>	
<b>Glossary</b> . . . . .	A1

# THEORETICAL PROBABILITY

## Today's Destination

How do you find the likelihood of an event without doing an experiment?



### Vocabulary

**Outcome** A result of an event

**Probability** The likelihood that an event will happen, expressed as a number from 0 to 1, with a probability of 0 meaning the event cannot occur and a probability of 1 meaning the event is certain



### Problem of the Day



How do you know Marta is correct?

---



---

Does Marta have a chance to win if Matt uses a regular coin with heads on one side and tails on the other? Explain your reasoning.

---

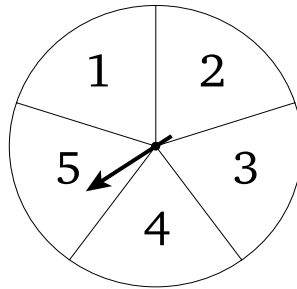


---



## TEST DRIVE

- 1** Which of these describes the likelihood of the spinner landing on an even number?



- A certain
- B impossible
- C less likely
- D more likely



*Think about whether there are more even or odd numbers.*

- 2** A survey at a popular ice-cream store found that 25% of customers prefer chocolate ice cream. Of the 500 people that come into the store on a certain day, how many of them are predicted to prefer chocolate ice cream?

- F 25
- G 100
- H 125
- J 500



*Set up a percent proportion.*



**SIDE TRIPS**

A **factorial (!)** is a notation that means to multiply all of the positive integers from 1 to a given number. For example,  $5!$  is read as *five factorial* and means the following:

$$5! = 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$$


- 1) What is  $6!$ ?

**Write It!**

 \_\_\_\_\_

- 2) What is  $\frac{8!}{5!}$ ?

**Write It!**

 \_\_\_\_\_

Factorial notation is helpful when working with permutations and combinations. You can evaluate factorials with your calculator by using the ! symbol.

- 3) Stephan took the 7 letters in his name and scrambled them. How many permutations are possible?

Write the permutation as a factorial and then use your calculator to evaluate.


**Write It!**

 \_\_\_\_\_

- 4) There are 10 students waiting in line. In how many different orders can they line up?

Write the permutation as a factorial and then use your calculator to evaluate.

**Write It!**

 \_\_\_\_\_