

**SAMPLE PAGES**  
from  
**The Competitive Edge**

**Passing the**  
**EOG 3 in MATH**

❖ *SECOND EDITION* ❖

by  
Jane Hereford

*Chapter 9 is enclosed  
to illustrate the quantity  
and quality of problems in  
this workbook.*

**CPC**

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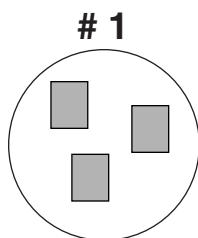
## PROBABILITY AND PERMUTATIONS

Probability tells what the chances are that something will happen.

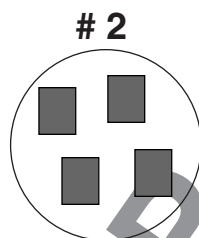
Sometimes it is **impossible** that something will happen.

Sometimes it is **certain** that something will happen.

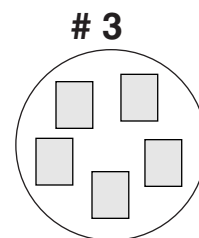
### EXAMPLES



3 red tiles



4 blue tiles



5 yellow tiles

Tell whether picking a blue tile is **impossible** or **certain** from the circles above.

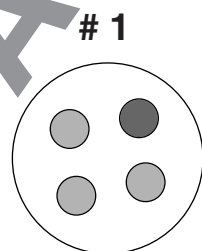
#1: **Impossible** to choose a blue tile, since all tiles are red.

#2: **Certain** to choose a blue tile, since all tiles are blue.

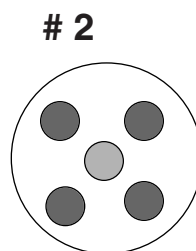
#3: **Impossible** to choose a blue tile, since all tiles are yellow.

Sometimes, it is **more likely**, **less likely**, or **equally likely** that something will happen.

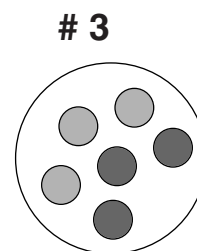
### EXAMPLES



1 blue button  
3 red buttons



1 red button  
4 blue buttons



3 red buttons  
3 blue buttons

Tell whether it is **more likely**, **less likely**, or **equally likely** that you would choose a red button.

#1: **More likely**, since there are more red buttons than blue buttons.

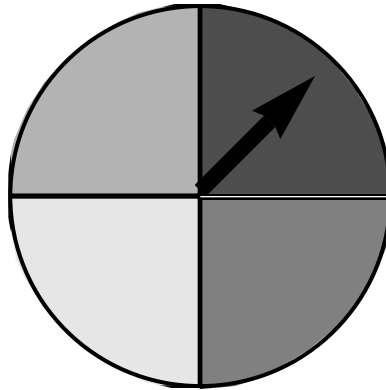
#2: **Less likely**, since there are more blue buttons than red buttons.

#3: **Equally likely**, since there are the same number of blue and red buttons.

You can predict the chance of something happening. You can determine the possible outcomes.

## EXAMPLES

The spinner can land on red, blue, yellow, or green.



These are your outcomes:

The chance of the spinner landing on red is 1 out of 4 chances.

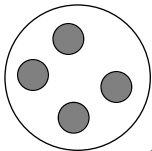
The chance of the spinner landing on blue is 1 out of 4 chances.

The chance of the spinner landing on yellow is 1 out of 4 chances.

The chance of the spinner landing on green is 1 out of 4 chances.

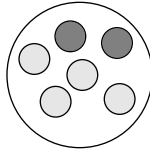
## PRACTICE

Write whether it is impossible or certain that you could choose a green button.



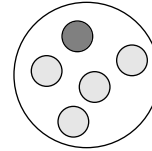
1. 4 green buttons

\_\_\_\_\_



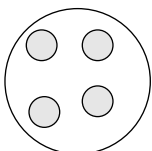
2. 2 green buttons  
4 pink buttons

\_\_\_\_\_



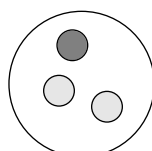
3. 1 green button  
4 pink buttons

\_\_\_\_\_



4. 4 pink buttons

\_\_\_\_\_



5. 2 pink buttons  
1 green button

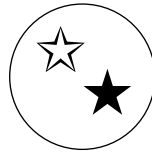
\_\_\_\_\_

Write more likely, less likely, or equally likely to tell how likely you are to choose a black star..



6. 2 white stars  
1 black star

---



7. 1 black star  
1 white star

---



8. 1 white star  
3 black stars

---



9. 3 white stars  
2 black stars

---

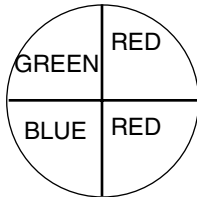


10. 4 black stars  
2 white stars

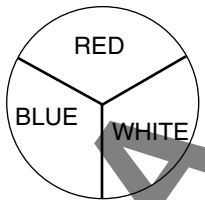
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Write all the possible outcomes. Then write the chance of spinning each outcome.

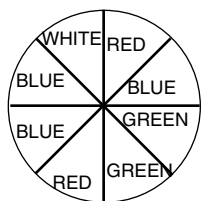
11.



12.

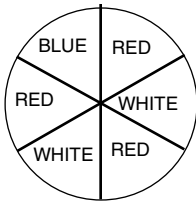


13.

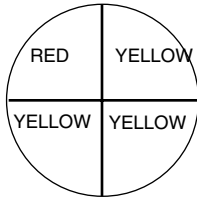


S

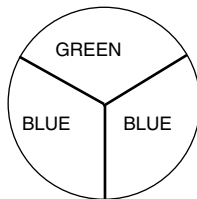
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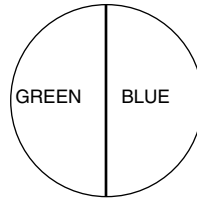
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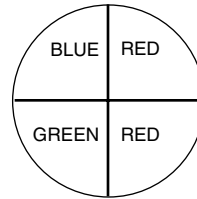
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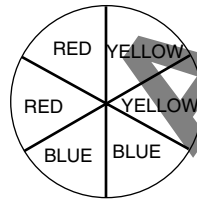
17.



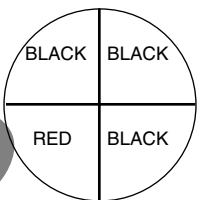
18.



19.



20.



E

L

P

M

S

# PERMUTATIONS

A permutation is an arrangement of things in a specific order.

## EXAMPLES

Arrange **R, S, T** in as many different orders as possible.

There are 6 different ways to arrange these letters:

RST, RTS, SRT, STR, TRS, TSR

Anytime you arrange 3 items, there will always be 6 different arrangements.

Arrange **red, white, and blue** in as many different orders as possible.

There are 6 different arrangements:

red, white, blue

red, blue, white

white, red, blue

white, blue, red

blue, red, white

blue, white, red

## PRACTICE

Arrange each group in as many different groups as possible.

1. shirt, pants, shoes

2. blue, green, red

S

3. red, white

8. Janet, Susan, Marge

E

4. orange, pear, apple

9. boy, girl, baby

L

5. plate, spoon

10. dog, cat

P

6. walnut, peanut, pecan

11. July, August, September

M

7. book, paper, pencil

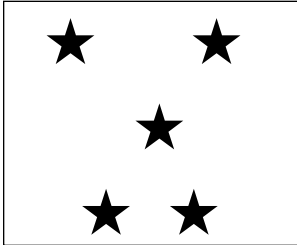
12. hat, coat, scarf

A

S

# REVIEW

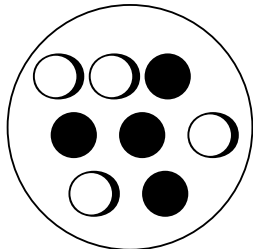
1. What is the probability of choosing a red star out of this box?



5 red stars

- a. impossible
- b. certain

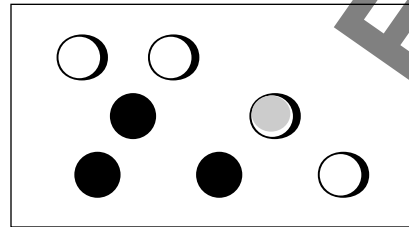
2. How likely are you to choose a black button from this circle?



4 black buttons  
4 blue buttons

- a. more likely
- b. less likely
- c. equally likely

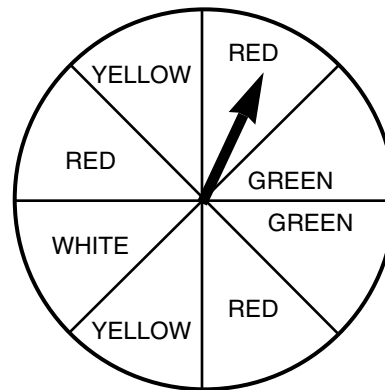
3. What is your chance of picking a blue button from this box?



3 blue buttons  
1 green button  
3 red buttons

- a. 1 out of 7
- b. 4 out of 7
- c. 3 out of 7
- d. 7 out of 7

4. What is your chance of landing on a RED on this spinner?

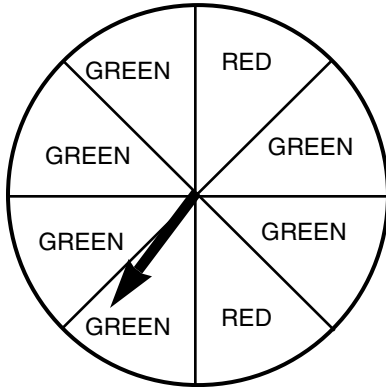


- a. 5 out of 8
- b. 2 out of 8
- c. 3 out of 5
- d. 3 out of 8

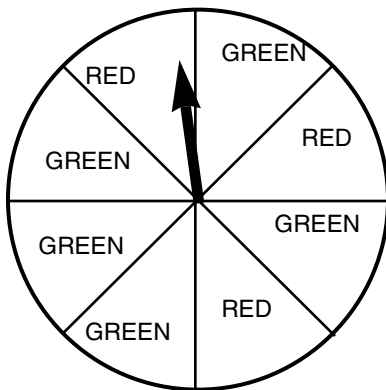


Use these spinners to answer questions 5 – 10.

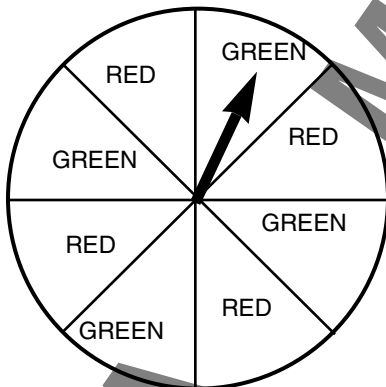
A



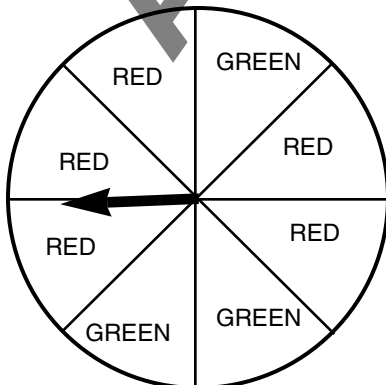
B



C



D



5. Which spinner is equally likely to land on red or green?

- a. A
- b. B
- c. C
- d. D

6. Which spinner is most likely to land on red?

- a. A
- b. B
- c. C
- d. D

7. Which spinner is less likely to land on red?

- a. A
- b. B
- c. C
- d. D

8. Which spinner has a “5 out of 8 chance” that you will land on green?

- a. A
- b. B
- c. C
- d. D

9. Which spinner has a “3 out of 8 chance” that you will land on green?

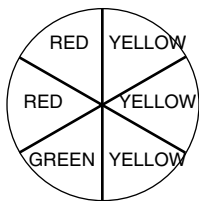
- a. A
- b. B
- c. C
- d. D

10. Which spinner has a “6 out of 8 chance” that you will land on green?
- A
  - B
  - C
  - D
11. John, Bob, and Ann are going to sit on the back seat of Mrs. Smith’s car. How many different ways can they sit?
- 8
  - 6
  - 2
  - 4
12. Jackie and Larry are going to stand beside the desk. In how many different ways can they stand?
- 8
  - 6
  - 2
  - 4
13. Jason, Bailey, and Cynthia are standing beside a fence. Cynthia is not first. Jason is last. In what order are they standing?
- Jason, Cynthia, Bailey
  - Bailey, Cynthia, Jason
  - Cynthia, Jason, Bailey
  - Bailey, Jason, Cynthia
14. Larry, Joe, and Mabel are lining up for recess. Mabel is not last. Joe is second. In what order did they line up?
- Larry, Joe, Mabel
  - Joe, Mabel, Larry
  - Mabel, Larry, Joe
  - Mabel, Joe, Larry
15. There are 10 green cards and 7 gray cards in a stack. If you draw one card, what is the probability that you will draw a gray card?
- 7 out of 17
  - 10 out of 17
  - 7 out of 10
  - 10 out of 7
16. Twenty red marbles and thirty green marbles are in a bag. What is the probability that you will choose a red marble?
- 30 out of 50
  - 20 out of 50
  - 20 out of 30
  - 30 out of 20

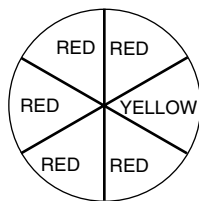


17. Which spinner will have a “2 out of 6 chance” of landing on yellow?

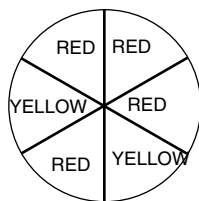
a.



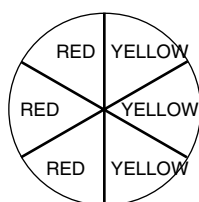
b.



c.



d.



18. There are 12 green stars, 14 blue stars, 9 white stars, and 6 silver stars in a jar. Which color are you most likely to pick out of the jar?

- a. green
- b. blue
- c. white
- d. silver

19. In a box are 10 red crayons, 4 black crayons, 5 orange crayons, and 7 purple crayons. If you choose one crayon, which color is less likely to be chosen?

- a. black
- b. purple
- c. red
- d. orange