

Name TEACHER

QUIZ IS TUESDAY 11/21

SHORT ANSWER/ PROBLEM SOLVING. Be sure to explain reasoning where necessary

Solve the problem.

- 1) Four students drive to school in the same car. The students claim they were late to school and missed a test because of a flat tire. On the makeup test, the instructor asks the students to identify the tire that went flat; front driver's side, front passenger's side, rear driver's side, or rear passenger's side. If the students didn't really have a flat tire and each randomly selects a tire, what is the probability that all four students select the same tire?

1) $\frac{1}{64}$

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

- 2) In a survey of college students, 880 said that they have cheated on an exam and 1721 said that they have not. If one college student is selected at random, find the probability that the student has cheated on an exam.

2) $\frac{880}{2601}$

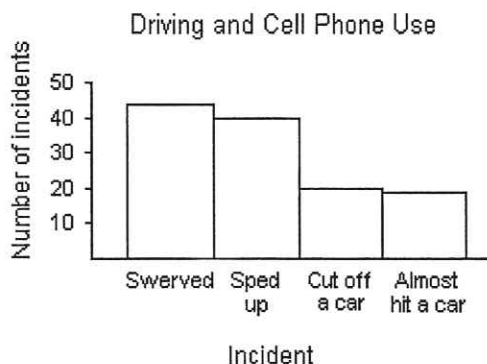
- 3) The data in the table represent the number of consumer complaints against major U.S. airlines. If one complaint from the table is randomly selected, find the probability that it was filed against United Airlines.

3) $\frac{1172}{2500}$

Airline	Number of Complaints
United	1172
Northwest	765
Continental	563

- 4) Use the following graph, which shows the types of incidents encountered with drivers using cell phones, to find the probability that a randomly chosen incident did not involve cutting off a car.

4) $\underline{.837}$
Approx.



5) What is the probability that a husband, wife, and daughter have the same birthday?

$$\frac{365}{365} \cdot \frac{1}{365} \cdot \frac{1}{365} = .00000751$$

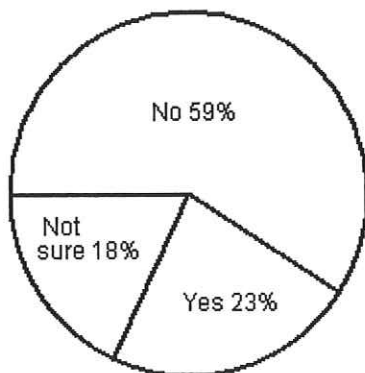
5) _____

6) Identify the sample space of the probability experiment: recording a response to the survey question and the gender of the respondent.

6) _____

Americans say keep the penny

Do you favor abolishing the penny?



YM YF NM NF
NSM NSF

Source: Harris interactive poll of 2136 adults taken June 10-16.
By Shannon Reilly and Robert W. Ahrens, USA Today

7) A multiple-choice test has five questions, each with five choices for the answer. Only one of the choices is correct. You randomly guess the answer to each question. What is the probability that you do not answer any of the questions correctly?

7) .32768

$$\frac{4}{5} \cdot \frac{4}{5} \cdot \frac{4}{5} \cdot \frac{4}{5} \cdot \frac{4}{5}$$

8) The data in the table represent the number of consumer complaints against major U.S. airlines. If one complaint from the table is randomly selected, find the probability that it was not filed against Continental Airlines. (Round to three decimal places.)

8) .96961

Airline	Number of Complaints
United	287
Northwest	256
Continental	237

\rightarrow $\frac{543}{780}$

9) Identify the sample space of the probability experiment: recording the number of days it snowed in Cleveland in the month of January.

9) 31 days

- 10) Identify the sample space of the probability experiment: rolling a single 12-sided die with sides numbered 1-12 10) 1-12
- 11) Classify the statement as an example of classical probability, empirical probability, or subjective probability. The probability that a newborn baby is a boy is $\frac{1}{2}$. 11) classical
- 12) A group of students were asked if they carry a credit card. The responses are listed in the table. 12) .590

Class	Credit Card Carrier	Not a Credit Card Carrier	Total
Freshman	46	14	60
Sophomore	32	8	40
Total	78	22	100

$\frac{46}{78}$

If a student is selected at random, find the probability that he or she is a freshman given that the student owns a credit card. Round your answers to three decimal places.

- 13) The distribution of blood types for 100 Americans is listed in the table. If one donor is selected at random, find the probability of selecting a person with blood type A+ or A-. 13) $\frac{40}{100} = .4$

Blood Type	O+	O-	A+	A-	B+	B-	AB+	AB-
Number	37	6	34	6	10	2	4	1

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

- 14) Which of the following cannot be a probability? 14) D
 A) 1 B) 85% C) 0.0002 D) $\frac{4}{3}$
- 15) Classify the events as dependent or independent. 15) B
 The events of getting two aces when two cards are drawn from a deck of playing cards and the first card is replaced before the second card is drawn.
 A) dependent B) independent
- 16) Find the probability of answering two true or false questions correctly if random guesses are made. Only one of the choices is correct. 16) A
 A) 0.25 B) 0.75 C) 0.5 D) 0.1

$\frac{1}{2} \frac{1}{2} = \frac{1}{4}$

17) A multiple-choice test has five questions, each with five choices for the answer. Only one of the choices is correct. You randomly guess the answer to each question. What is the probability that you answer the first two questions correctly? 17) D

A) 0.2 B) 0.4 C) 0.02 D) 0.04

18) A single six-sided die is rolled. Find the probability of rolling a seven. 18) C

A) 0.5 B) 1 C) 0 D) 0.1

SKIP

19) Use Baye's Theorem to solve this problem, A paper bag contains two red balls and one blue ball. A plastic bag contains three blue balls and one red ball. A coin is tossed. If it falls heads up, the paper bag is selected and a ball is drawn. If the coin falls tails up, the plastic bag is selected and a ball is drawn. If a red ball is selected, what is the probability that it came from the paper bag? 19) ~~X~~

A) $\frac{1}{3}$ B) $\frac{8}{11}$ C) $\frac{3}{8}$ D) $\frac{1}{8}$

20) Classify the events as dependent or independent. Events A and B where $P(A) = 0.7$, $P(B) = 0.8$, and $P(A \text{ and } B) = 0.56$ 20) A

A) independent $.7 \times .8$ B) dependent

SKIP

21) Classify the statement as an example of classical probability, empirical probability, or subjective probability. The probability that interest rates will rise during the summer is 0.05. 21) ~~X~~

A) empirical probability B) subjective probability C) classical probability

22) Rank the probabilities of 10%, $\frac{1}{5}$, and 0.06 from the most likely to occur to the least likely to occur. 22) D

A) 10%, $\frac{1}{5}$, 0.06 B) 0.06, 10%, $\frac{1}{5}$ C) 0.06, $\frac{1}{5}$, 10% D) $\frac{1}{5}$, 10%, 0.06

23) If one card is drawn from a standard deck of 52 playing cards, what is the probability of drawing a heart? 23) D

A) $\frac{3}{4}$ $\frac{13}{52}$ B) 1 C) $\frac{1}{2}$ D) $\frac{1}{4}$

24) At the local racetrack, the favorite in a race has odds 3:2 against winning. What is the probability that the favorite wins the race? 24) C

A) 0.4 B) 0.2 $\frac{3}{5}$ C) 0.6 D) 0.8

25) A coin is tossed. Find the probability that the result is heads. 25) C

A) 0.9 B) 1 C) 0.5 D) 0.1

SHORT ANSWER/ PROBLEM SOLVING. Be sure to explain reasoning where necessary

26) The distribution of Master's degrees conferred by a university is listed in the table.

26) .262

Major	Frequency
Mathematics	216
English	207
Engineering	86
Business	176
Education	243

$$\frac{243}{928}$$

What is the probability that a randomly selected student graduating with a Master's degree has a major of Education? Round your answer to three decimal places.

27) The probability it will rain is 40% each day over a three-day period. What is the probability it will rain at least one of the three days?

27) .304

$$(.4)(.6)(.6) + (.4)(.4)(.6) + (.4)(.4)(.4)$$

28) Identify the sample space of the probability experiment: shooting a free throw in basketball.

28) _____

2 - Hit/MISS

29) How many ways can the letters in the word ALGEBRA Be arranged?

$$\frac{7!}{2!} = \frac{7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{2 \cdot 1} = 2520$$

Ch 3: P and C Practice

Evaluate each expression.

1) ${}_6P_3 = 120$

2) ${}_5P_5 = 120$

Find the probability of each event.

3) A gardener has ten identical-looking tulip bulbs, of which each will produce a different color tulip. Seven of the colors are unknown, however one will become white, one will become yellow, and one will become pink. He plants them arbitrarily in a row. When the flowers start to bloom, what is the probability that the yellow one is first in the row, the white one is second, and the pink one is at the end of the row?

$\frac{1}{720}$ $\frac{1}{10} \cdot \frac{1}{9} \cdot \frac{1}{8} \cdot \frac{1}{7} \cdot \frac{1}{6} \cdot \frac{1}{5} \cdot \frac{1}{4} \cdot \frac{1}{3} \cdot \frac{1}{2} \cdot \frac{1}{1}$

y w _ _ _ _ _ _ _ p

4) A bag contains nine real diamonds and four fake diamonds. If nine diamonds are picked from the bag at random, what is the probability that all of them are real?

$\frac{{}_9C_9}{{}_{13}C_9} = \frac{1}{715}$

5) A child is drawing a rainbow using a box of eleven different colored crayons, which include the seven required colors. After drawing the red, orange, yellow, and green arcs in the proper order, she forgets the last three colors. From the remaining seven crayons, she chooses three at random to finish drawing the rainbow. What is the probability that she correctly finishes the ROYGBIV rainbow?

$\frac{1}{7} \cdot \frac{1}{6} \cdot \frac{1}{5} = \frac{1}{210}$

$\frac{1}{210}$

6) A nature preserve has a population of six black bears. They have been tagged #1 through #6, so they can be observed over time. Two of them are randomly selected and captured for evaluation. What is the probability that bears #3 and #5 are captured for evaluation?

$\frac{1}{6} \cdot \frac{1}{5} = \frac{1}{30} \times 2$
 ↑
 order

$\frac{1}{15}$

- 7) A child is drawing a rainbow using a box of fourteen different colored crayons, which include the seven required colors. After drawing the red, orange, yellow, and green arcs in the proper order, she forgets the last three colors. From the remaining ten crayons, she chooses three at random to finish drawing the rainbow. What is the probability that she correctly finishes the ROYGBIV rainbow?

- 8) A politician is about to give a campaign speech and is holding a stack of thirteen cue cards, of which the first 3 are the most important. Just before the speech, she drops all of the cards and picks them up in a random order. What is the probability that cards #1, #2, and #3 are still in order on the top of the stack?

$$\frac{1}{13} \cdot \frac{1}{12} \cdot \frac{1}{11} = \frac{1}{1716}$$

Evaluate each expression.

9) ${}_{14}C_9$

2002

10) ${}_{21}C_{18}$

1330

Find the probability of each event.

- 11) There are twelve songs on your playlist. Seven of them are country and five are pop. With random shuffle and no repetition, you listen to seven songs. What is the probability that you listened to all country songs?

$$\frac{{}^7C_7}{{}^{12}C_7} = \frac{1}{\frac{12 \cdot 11 \cdot 10 \cdot 9 \cdot 8 \cdot 7}{4 \cdot 2}} = \frac{1}{792}$$

- 12) A gambler places a bet on a horse race. To win, she must pick the top three finishers in any order. Twelve horses of equal ability are entered in the race. Assuming the horses finish in a random order, what is the probability that the gambler will win her bet?

$$\frac{1}{220}$$

- 13) A child is drawing a rainbow using a box of sixteen different colored crayons, which include the seven required colors. After drawing the red, orange, yellow, and green arcs in the proper order, he forgets the last three colors. From the remaining twelve crayons, he chooses three at random to finish drawing the rainbow. What is the probability that he correctly finishes the ROYGBIV rainbow?

Find the number of possible outcomes in the sample space.

- 14) A pizza stand offers both hand-tossed and pan pizza. Customers can add any combination of the nine available toppings.

$$2 \times 9 = 18$$

- 15) A football player attempts six passes in overtime. Each pass attempt results in a completion, an incompleting, or a turnover.

$$3 \times 6 = 18$$

- 16) A spinner can land on either red, blue, or green. You spin five times.

$$3 \times 5 = 15$$