

Conditional Probability

CollegeBoard Question Bank

Abstract

This exercise sheet contains

- an **Easy** category with 11 questions;
- a **Medium** category with 11 questions;
- a **Hard** category with 7 questions

for you to attempt. A digital copy of this sheet is available for you on [moodle](#). Feel free to utilize [the Question Space on Teams](#) to ask for guidance.

Best,
Omar :)

Conditional Probability

Easy

(1) 1353b86e

MULTIPLE CHOICE

One answer only

Colors of Marbles in a Bag

Color	Number
Red	8
Blue	10
Green	22
Total	40

The table shows the number of different colors of marbles in a bag. If a marble is chosen at random from the bag, what is the probability that the marble will be blue?

- a. $\frac{18}{40}$
- b. $\frac{22}{40}$
- c. $\frac{10}{40}$
- d. $\frac{30}{40}$

(2) d89c1513

MULTIPLE CHOICE

One answer only

Customer Purchases at a Gas Station

	Beverage purchased	Beverage not purchased	Total
Gasoline purchased	60	25	85
Gasoline not purchased	35	15	50
Total	90	40	135

On Tuesday, a local gas station had 135 customers. The table above summarizes whether or not the customers on Tuesday purchased gasoline, a beverage, both, or neither. Based on the data in the table, what is the probability that a gas station customer selected at random on that day did not purchase gasoline?

- a. $\frac{35}{50}$
- b. $\frac{15}{50}$
- c. $\frac{50}{135}$
- d. $\frac{15}{40}$

(3) 46545dd6

MULTIPLE CHOICE

One answer only

Number of High School Students Who Completed Summer Internships

High school	Year				
	2008	2009	2010	2011	2012
Foothill	87	80	75	76	70
Valley	44	54	65	76	82
Total	131	134	140	152	152

The table above shows the number of students from two different high schools who completed summer internships in each of five years. No student attended both schools. Of the students who completed a summer internship in 2010, which of the following represents the fraction of students who were from Valley High School?

- a. $\frac{75}{140}$
- b. $\frac{10}{140}$
- c. $\frac{65}{140}$
- d. $\frac{65}{75}$

(4) **16cea46c** MULTIPLE CHOICE One answer only

Voice type	Number of singers
Countertenor	4
Tenor	6
Baritone	10
Bass	5

A total of 25 men registered for singing lessons. The frequency table shows how many of these singers have certain voice types. If one of these singers is selected at random, what is the probability he is a baritone?

- a. 0.60
- b. 0.67
- c. 0.10
- d. 0.40

(5) **b680e76d** MULTIPLE CHOICE One answer only

A survey taken by 1,000 students at a school asked whether they played school sports. The table below summarizes all 1,000 responses from the students surveyed.

	Males	Females
Play a school sport	312	220
Do not play a school sport	?	216

How many of the males surveyed responded that they do not play a school sport?

- a. 468
- b. 109
- c. 252
- d. 688

(6) **60caadfd** MULTIPLE CHOICE One answer only

Each rock in a collection of 70 rocks was classified as either igneous, metamorphic, or sedimentary, as shown in the frequency table.

Classification	Frequency
igneous	10
metamorphic	33
sedimentary	27

If one of these rocks is selected at random, what is the probability of selecting a rock that is igneous?

- a. $\frac{10}{70}$
- b. $\frac{10}{60}$
- c. $\frac{27}{10}$
- d. $\frac{10}{33}$

(7) **e5b5fbd** MULTIPLE CHOICE One answer only

Of the 8 planets in our solar system, 4 are considered rocky. If a student randomly selects 1 of those 8 planets as a topic for a report, what is the probability that the selected planet will be rocky?

- a. 2
- b. $\frac{1}{2}$
- c. $\frac{1}{4}$
- d. $\frac{1}{8}$

(8) ec7b0eb8

MULTIPLE CHOICE

One answer only

Texting behavior	Talks on cell phone daily	Does not talk on cell phone daily	Total
Light	110	146	256
Medium	139	164	303
Heavy	166	74	240
Total	415	384	799

In a study of cell phone use, 799 randomly selected US teens were asked how often they talked on a cell phone and about their texting behavior. The data are summarized in the table above. If one of the 799 teens surveyed is selected at random, what is the probability that the teen talks on a cell phone daily?

- a. $\frac{415}{799}$
- b. $\frac{384}{415}$
- c. $\frac{1}{799}$
- d. $\frac{384}{799}$

(9) **12dbe3de** MULTIPLE CHOICE One answer only

A store received a shipment of 1,000 MP3 players, 4 of which were defective. If an MP3 player is randomly selected from this shipment, what is the probability that it is defective?

- a. 4
- b. 0.4
- c. 0.004
- d. 0.04

(10) **2a08d878** MULTIPLE CHOICE One answer only

There are n nonfiction books and 12 fiction books on a bookshelf. If one of these books is selected at random, what is the probability of selecting a nonfiction book, in terms of n ?

- a. $\frac{n}{12}$
- b. $\frac{12}{n+12}$
- c. $\frac{12}{n}$
- d. $\frac{n}{n+12}$

(11) **1dcea480** MULTIPLE CHOICE One answer only

A bag contains a total of 60 marbles. A marble is to be chosen at random from the bag. If the probability that a blue marble will be chosen is 0.35 , how many marbles in the bag are blue?

- a. 21
- b. 35
- c. 25
- d. 39

Medium

(1) b1b5300b

MULTIPLE CHOICE

One answer only

Prices of 14 Different Cars

Type of car	Priced at no more than \$25,000	Priced greater than \$25,000	Total
Nonhybrid	5	3	8
Hybrid	2	4	6
Total	7	7	14

The table above shows information about 14 cars listed for sale on an auto dealership's website. If one of the cars listed for sale is selected at random, what is the probability that the car selected will be a hybrid car priced at no more than \$25,000 ?

- a. $\frac{2}{7}$
- b. $\frac{1}{7}$
- c. $\frac{1}{3}$
- d. $\frac{4}{7}$

(2) e1ad3d41 MULTIPLE CHOICE One answer only

Coat color	Eye color		
	Deep blue	Light brown	Total
Cream-tortoiseshell	16	16	32
Chocolate	12	4	16
Total	28	20	48

The data on the coat color and eye color for 48 Himalayan kittens available for adoption were collected and summarized in the table above. What fraction of the chocolate-colored kittens has deep blue eyes?

- a. $\frac{12}{16}$
- b. $\frac{12}{48}$
- c. $\frac{12}{28}$
- d. $\frac{16}{32}$

(3) **0301c5dc** MULTIPLE CHOICE One answer only

The table below shows the number of state parks in a certain state that contain camping facilities and bicycle paths.

	Has bicycle paths	Does not have bicycle paths
Has camping facilities	20	5
Does not have camping facilities	8	4

If one of these state parks is selected at random, what is the probability that it has camping facilities but does not have bicycle paths?

- a. $\frac{5}{25}$
- b. $\frac{8}{28}$
- c. $\frac{5}{9}$
- d. $\frac{5}{37}$

(4) **2df8f293** SHORT ANSWER Case-Insensitive

Each vertex of a 14-sided polygon is labeled with one of the 14 letters A through N , with a different letter at each vertex. If one vertex is selected at random, what is the probability that the letter D will be at the selected vertex? (Express your answer as a decimal or fraction, not as a percent.)

(5) **912cd125** MULTIPLE CHOICE One answer only

For a science project, Anka recorded whether it rained each weekday and weekend day for 12 weeks. Her results are summarized in the table below. Weekday and Weekend Day Rain for 12 Weeks

	Rain	No rain	Total
Number of weekdays	12	48	60
Number of weekend days	8	16	24
Total	20	64	84

If one of the days on which there was no rain is selected at random, what is the probability the day was a weekend day?

- a. $\frac{4}{21}$
- b. $\frac{3}{4}$
- c. $\frac{1}{4}$
- d. $\frac{4}{3}$

(6) **30db8f77** SHORT ANSWER Case-Insensitive

At a conference, there are a total of 275 attendees. Each attendee is assigned to either group A , group B , or group C . If one of these attendees is selected at random, the probability of selecting an attendee who is assigned to group A is 0.44 and the probability of selecting an attendee who is assigned to group B is 0.24 . How many attendees are assigned to group C ?

(7) **38a9ac45** MULTIPLE CHOICE One answer only

If 1,200 customers register for new accounts at a social media website every day, what fraction of the first 60,000 new accounts are registered in the first 5 days?

- a. $\frac{1}{10}$
- b. $\frac{1}{5}$
- c. $\frac{1}{50}$
- d. $\frac{1}{12}$

(8) b6569d0e

MULTIPLE CHOICE

One answer only

United States Presidents from 1789 to 2015	
Ages	Number
40 – 44	2
45 – 49	7
50 – 54	13
55 – 59	11
60 – 64	7
65 – 69	3

The table above gives the number of United States presidents from 1789 to 2015 whose age at the time they first took office is within the interval listed. Of those presidents who were at least 50 years old when they first took office, what fraction were at least 60 years old?

- a. $\frac{25}{34}$
- b. $\frac{34}{10}$
- c. $\frac{10}{34}$
- d. $\frac{24}{43}$

(9) a3384df0

MULTIPLE CHOICE

One answer only

Penguin Exhibit

Type of penguin	Male	Female	Total
Chinstrap	41	59	100
Emperor	8	27	35
Gentoo	49	54	103
Macaroni	42	40	82
Total	140	180	320

The number of penguins in a zoo exhibit, sorted by gender and type of penguin, is shown in the table above. Which type of penguin has a female population that is the closest to being $\frac{1}{3}$ of the total female penguin population in the exhibit?

- a. Macaroni
- b. Chinstrap
- c. Gentoo
- d. Emperor

(10) **46b2e169** SHORT ANSWER Case-Insensitive

A box contains 13 red pens and 37 blue pens. If one of these pens is selected at random, what is the probability of selecting a red pen? (Express your answer as a decimal or fraction, not as a percent.)

(11) f8696cd8

MULTIPLE CHOICE

One answer only

	Human Resources	Accounting
Bachelor's degree	4	3
Master's degree	2	6

The table above shows the number of people who work in the Human Resources and Accounting departments of a company and the highest level of education they have completed. A person from one of these departments is to be chosen at random. If the person chosen works in the Human Resources department, what is the probability that the highest level of education the person completed is a master's degree?

- a. $\frac{1}{3}$
- b. $\frac{1}{4}$
- c. $\frac{2}{15}$
- d. $\frac{8}{15}$

Hard

(1) e29586d5 SHORT ANSWER Case-Insensitive

Number of Contestants by Score and Day

	5 out of 5	4 out of 5	3 out of 5	2 out of 5	1 out of 5	0 out of 5	Total
Day 1	2	3	4	6	2	3	20
Day 2	2	3	5	5	4	1	20
Day 3	3	3	4	5	3	2	20
Total	7	9	13	16	9	6	60

The same 20 contestants, on each of 3 days, answered 5 questions in order to win a prize. Each contestant received 1 point for each correct answer. The number of contestants receiving a given score on each day is shown in the table above. No contestant received the same score on two different days. If a contestant is selected at random, what is the probability that the selected contestant received a score of 5 on Day 2 or Day 3, given that the contestant received a score of 5 on one of the three days?

(2) **d4413871** SHORT ANSWER Case-Insensitive

	Blood type			
Rhesus factor	A	B	AB	O
+	33	9	3	37
-	7	2	1	x

Human blood can be classified into four common blood types-A, B, AB, and O . It is also characterized by the presence (+) or absence (−) of the rhesus factor. The table above shows the distribution of blood type and rhesus factor for a group of people. If one of these people who is rhesus negative (−) is chosen at random, the probability that the person has blood type B is $\frac{1}{9}$. What is the value of x ?

(3) 6626cac3

SHORT ANSWER

Case-Insensitive

	Phone	Email
Dinner dance	55%	80%
Football game	20%	10%
Picnic	20%	5%
Pool party	5%	5%
Total	100%	100%

An alumni association survey asked each high school graduate to select the one activity he or she preferred for the association's next event. Some of the people responded by phone, and the others responded by email. The table above shows the distribution of preferred activity, in percent, for each response type used. For the survey, the number of email responses was twice the number of phone responses. If a person who preferred a picnic is selected at random, what is the probability that the person responded by email?

(4) **585de39a** SHORT ANSWER Case-Insensitive

On May 10, 2015, there were 83 million Internet subscribers in Nigeria. The major Internet providers were MTN, Globacom, Airtel, Etisalat, and Visafone. By September 30, 2015, the number of Internet subscribers in Nigeria had increased to 97 million. If an Internet subscriber in Nigeria on September 30, 2015, is selected at random, the probability that the person selected was an MTN subscriber is 0.43 . There were p million MTN subscribers in Nigeria on September 30, 2015. To the nearest integer, what is the value of p ?

(5) **6a715bed** SHORT ANSWER Case-Insensitive

The table summarizes the distribution of age and assigned group for 90 participants in a study.

	0 – 9 years	10 – 19 years	20+ years	Total
Group A	7	14	9	30
Group B	6	4	20	30
Group C	17	12	1	30
Total	30	30	30	90

One of these participants will be selected at random. What is the probability of selecting a participant from group A , given that the participant is at least 10 years of age? (Express your answer as a decimal or fraction, not as a percent.)

- (6) **5dc386fb** MULTIPLE CHOICE One answer only

The table below shows the distribution of US states according to whether they have a state-level sales tax and a statelevel income tax.

2013 State-Level Taxes	
No state sales tax	State sales tax
State income tax 4	39
No state income tax 1	6

To the nearest tenth of a percent, what percent of states with a state-level sales tax do not have a state-level income tax?

- a. 12.0%
- b. 13.3%
- c. 14.0%
- d. 6.0%

(7) **ecd09c38** MULTIPLE CHOICE One answer only

Employees working for a customer service line at an electric company recorded all the calls last Monday and noted whether the caller asked for repairs and whether the caller asked about a bill. The results are summarized in the table below.

	Asked for repairs	Did not ask for repairs	Total
Asked about a bill	48	623	671
Did not ask about a bill	130	90	220
Total	178	713	891

If a caller last Monday who asked about his or her bill is selected at random, which of the following is closest to the probability that the customer also asked for repairs?

- a. 0.05
- b. 0.20
- c. 0.07
- d. 0.27

Total of marks: 29