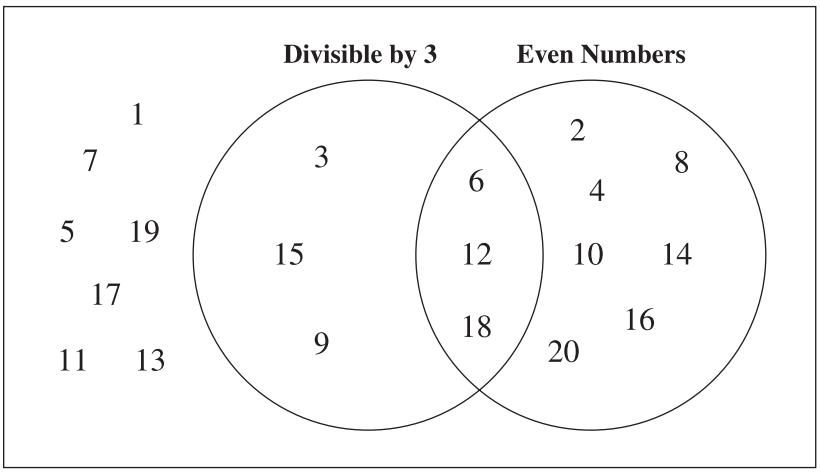
Use the following information to answer question 6.

For the set of whole numbers from 1 to 20 inclusive, Theresa knows that some numbers are divisible by 3 and some numbers are even. She is going to write each number on a different ball and place the balls in a box.

SE

6. If one ball is randomly selected from the box, what is the probability that the number written on it is divisible by 3 or is an even number?

Possible Solution:



The favourable outcomes are the outcomes within the circles, so the number of favourable outcomes is 13. $P(\text{Divisible by 3 or Even Number}) = \frac{13}{20}$

or

$P(\text{Divisible by 3} \cup \text{Even number})$
$= P(\text{Divisible by 3}) + P(\text{Even Number}) - P(\text{Divisible by 3} \cap \text{Even Number})$
$= \frac{6}{20} + \frac{10}{20} - \frac{3}{20}$
$= \frac{13}{20}$

7. A particular traffic light at the outskirts of a town is red for 30 s, green for 25 s, and yellow for 5 s in every minute. When a vehicle approaches the traffic light, the probability that the light will be red or yellow is

*__A.__ $\frac{7}{12}$

__B.__ $\frac{1}{2}$

__C.__ $\frac{1}{12}$

__D.__ $\frac{1}{24}$

Use the following information to answer numerical-response question 8.

Malaga, Spain, lies in a region of Europe known as the Costa Del Sol (Coast of the Sun). The probability of sunshine on any given day in the region is approximately 0.89.

Numerical Response

8. In a non-leap year of 365 days, the average number of days of the year that a tourist could expect to experience weather other than sunshine, to the nearest whole number, is _____ days.

Possible Solution:

$1 - 0.89 = 0.11$

$0.11 \times 365 = 40.15$

≈ 40 days

Use the following information to answer numerical-response question 9.

Some possible events for rolling a regular six-sided die are listed below.

1 An even number
2 A number less than 3
3 A number that is a multiple of 3
4 A number that is greater than or equal to 2

Numerical Response

9. From the list above, the two events that are mutually exclusive are numbered _____ and _____.

Solution:
23 **or** 32

Use the following information to answer question 10.

A recent survey determined that 85% of a population watches TV at least once a day, 35% of the population uses a computer at least once a day, and 25% of the population do both.

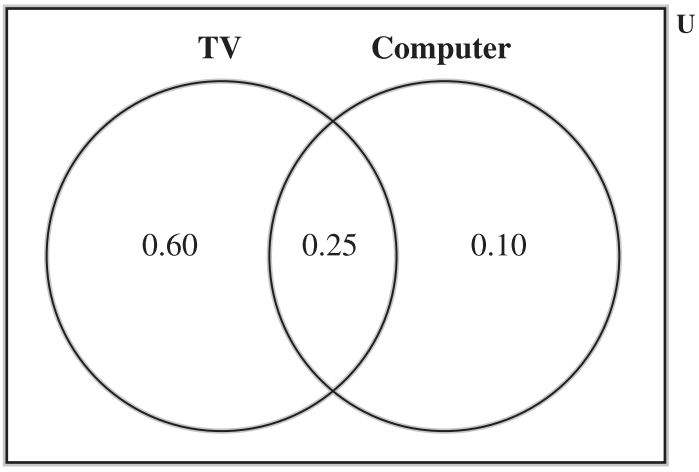
SE

10. **a.** What is the probability that a person chosen at random from the population watches TV at least once a day or uses a computer at least once a day?

Possible Solution:
$P(\text{TV}) = 0.85$
$P(\text{Computer}) = 0.35$
$P(\text{TV} \cap \text{Computer}) = 0.25$

$$\begin{aligned} P(\text{TV} \cup \text{Computer}) &= P(\text{TV}) + P(\text{Computer}) - P(\text{TV} \cap \text{Computer}) \\ &= 0.85 + 0.35 - 0.25 \\ &= 0.95 \end{aligned}$$

or



$P(\text{TV} \cup \text{Computer}) = 0.60 + 0.25 + 0.10 = 0.95$

b. Are the events of watching TV at least once a day and using the computer at least once a day mutually exclusive events? Justify your answer.

Possible Solution:
These events are not mutually exclusive because some of the survey participants do both activities.

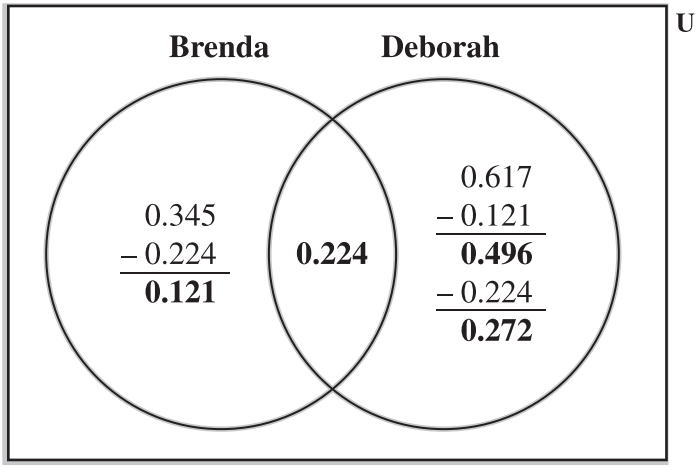
Use the following information to answer question 11.

The probability of Brenda getting a hit in a baseball game is 0.345. The probability of Brenda or Deborah getting a hit during the game is 0.617. The probability of both Brenda and Deborah getting hits during the game is 0.224.

SE

11. Determine the probability of Deborah getting a hit in the game.

Possible Solution:



$P(\text{D}) = 0.224 + 0.272$
$= 0.496$

or

$P(\text{B} \cup \text{D}) = P(\text{B}) + P(\text{D}) - P(\text{B} \cap \text{D})$
$0.617 = 0.345 + \text{P(D)} - 0.224$
$0.496 = P(\text{D})$

Use the following information to answer question 12.

Alan places five white marbles and five black marbles into a bag. He then performs the two experiments described below to select two marbles from the bag.

First Experiment
One marble is selected from the bag and replaced before a second marble is selected.

Second Experiment
One marble is selected from the bag and **not** replaced before a second marble is selected.

The following two events are the same for each experiment:

Event X: The first marble selected is black.
Event Y: The second marble selected is white.

12. *In the first experiment, Event X and Event Y are* ___***i***___ , *and in the second experiment, Event X and Event Y are* ___***ii***___ .

The statement above is completed by the information in row

Row	*i*	*ii*
A.	dependent	independent
B.	dependent	dependent
C.	independent	independent
***D.**	independent	dependent

13. A box contains 6 blue balls and 4 red balls. Two balls are drawn from the box, one after the other, without replacement. The probability, to the nearest hundredth, that the first ball drawn is blue and the second ball drawn is red is _____.

Possible Solution:

$P(\text{blue}) \cdot P(\text{red} \mid \text{blue})$

$\frac{6}{10} \cdot \frac{4}{9} = 0.27$

14. Based on previous performance, the probability of a particular baseball team winning any game is $\frac{4}{5}$. The probability that this team will win their next 2 games is

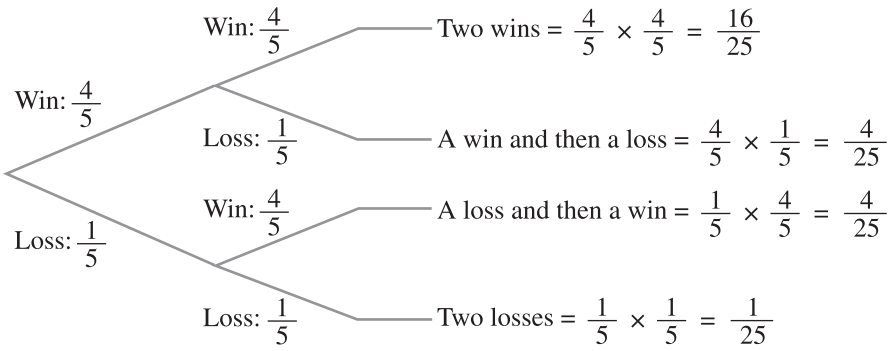
A. $\frac{1}{5}$

B. $\frac{4}{5}$

C. $\frac{1}{25}$

***D.** $\frac{16}{25}$

Possible Solution:



The probability that the baseball team wins their next two games is given by two wins = $\frac{16}{25}$.

SE

b. What is the probability that the team will win 1 game and lose 1 game during the next 2 games?

Possible Solution:

$P(\text{Win} \cap \text{Lose}) = P(\text{Win 1st} \cap \text{Lose 2nd}) + P(\text{Lose 1st} \cap \text{Win 2nd})$

$= \frac{4}{25} + \frac{4}{25}$

$= \frac{8}{25}$

Use the following information to answer question 15.

From a particular bag that contains tiles, one tile is selected and the colour is recorded. From a second bag that contains marbles, one marble is selected and the colour is recorded. The probability of randomly selecting a blue tile from the first bag is 0.62. The probability of randomly selecting a blue tile from the first bag **and** a blue marble from the second bag is 0.46.

SE

15. The probability, to the nearest hundredth, of selecting a blue marble from the second bag is _____.

Possible Solution:

$P(\text{Blue tile} \cap \text{Blue marble}) = P(\text{Blue tile}) \cdot P(\text{Blue marble})$

$0.46 = 0.62 \cdot P(\text{Blue marble})$

$0.74 = P(\text{Blue marble})$

16. A hotel offers free breakfast to its guests. One morning the hotel has 3 different kinds of juice, 4 different kinds of cereal, and 2 different types of pastries available. If a guest can choose one kind of juice, one kind of cereal and one type of pastry, how many different possible breakfasts can be ordered?

Possible Solution:

$$\underset{\textbf{juice}}{\_\_\_\_\_} \cdot \underset{\textbf{cereal}}{\_\_\_\_\_} \cdot \underset{\textbf{pastry}}{\_\_\_\_\_}$$

$$\underset{\textbf{juice}}{3} \cdot \underset{\textbf{cereal}}{4} \cdot \underset{\textbf{pastry}}{2}$$

$= 24$