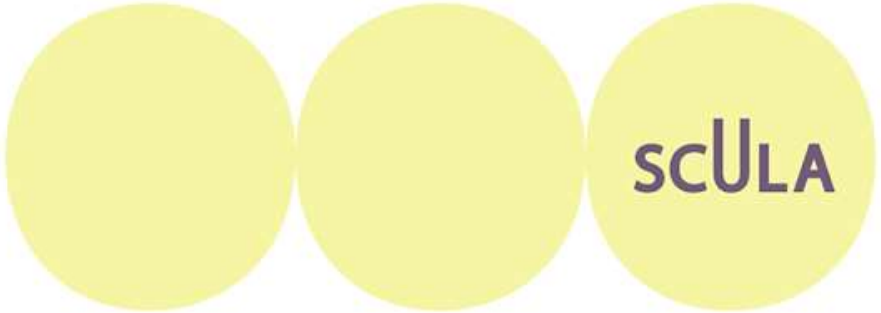
SAT MATH SECTION

Probability

How likely it is that...

- A probability question on the SAT asks you to identify how likely a particular event is to occur. How likely is it that you'll pick a red marble out of a bag? How likely is it that a particular person will be chosen out of a lottery ?



The Probability Formula

Asking for the probability of an event is the same thing as asking for the “odds” of any of happening. And this probability is expressed as a fraction of the likelihood of the event over all the outcomes possible.

So how likely is it that you’ll get tails if you flip a coin? The chances are 1 in 2.

1 for the number of outcomes you want (tails) and 2 for the total number of possibilities (heads and tails).

According to this example, we conclude the formula of a probability.

$$P = \frac{desired\ outcome}{all\ possible\ outcomes}$$

Let's take an example

There are ten students in the class. Every day, the teacher selects a random student to erase the board. What are the odds that Student A will be selected to clean the board today?

The probability of Student A being selected is 1/10. The desired

outcome is 1 because Student A is only one student.

And there are 10 students total, so there are 10 possible outcomes (students to pick from).

SCULA

Let’s look at another scenario:

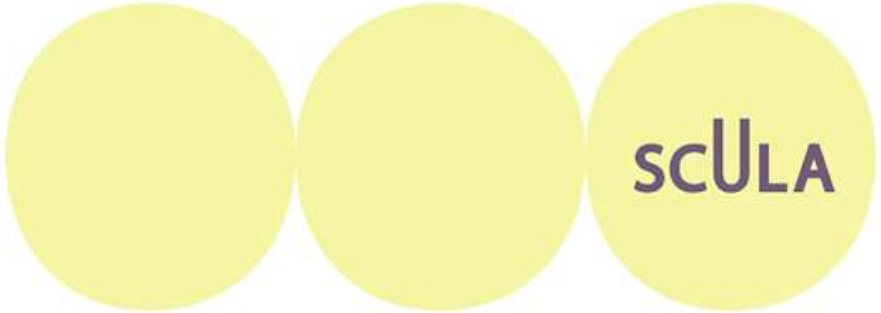
What are the odds that either Student A or Student B will be selected to clean the board today?

The probability is now 2/10 (or 1/5). Why? Because there are now 2 possible students to choose from, but the total number of students is still 10.

Either/Or Probability

As we saw above with our example of multiple students selected at random to clean a board, an either/or probability question asks how likely it is that either one of two or more events will occur. This increases the odds of our desired outcome because we do not care which of the two events happen, only that one of them does.

To solve this kind of problem, we must therefore add the probability of each individual event. Their sum is the probability of either event happening.



Either/Or Probability Formula :

An example for this situation would be asking the following question :

What is the probability of drawing either an ace or a queen from a deck of cards?

In this case we have two outcomes .

Outcome A: drawing an ace .

Outcome B: drawing a queen .

$$P = \frac{desired\ outcome\ A}{all\ possible\ outcomes} + \frac{desired\ outcome\ B}{all\ possible\ outcomes}$$

SCULA

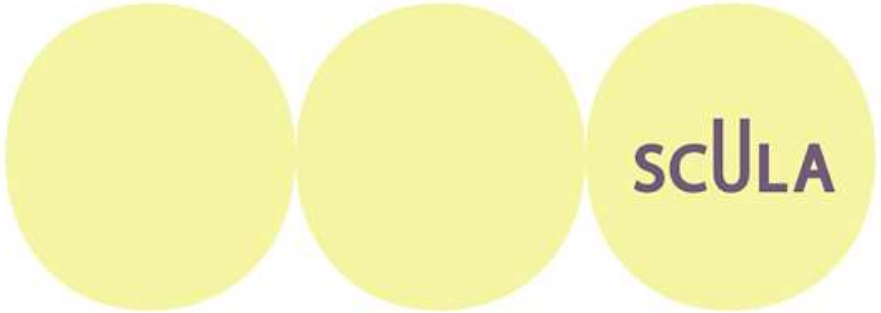
Solution

There are 4 aces in a deck of cards and 52 cards total. Therefore, the probability of drawing an ace is 452=113 (or 7.69%).

There are also 4 queens in a deck of cards. So, the probability of drawing a queen is also 113.

So, the probability of drawing either an ace or a queen is

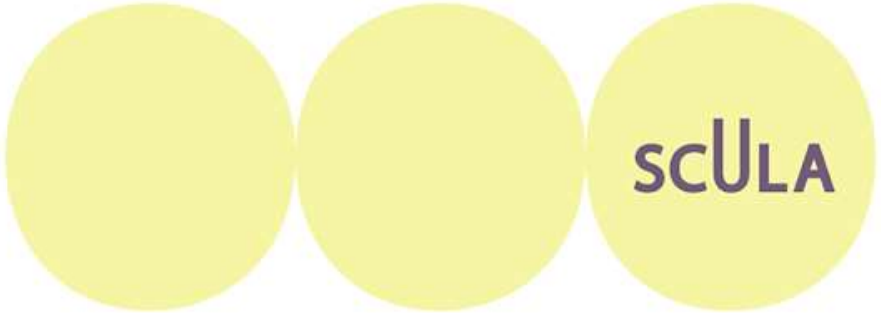
1/ 13 + 1/ 13= 2/13 or 15.38%.



Conditional Probability

Very occasionally, the SAT will hit you with a simple conditional probability question. (I found one spread across all 8 free SAT practice tests).

Conditional probability is the chances of an event (B) happening given that another event or condition (A) has already happened or been fulfilled. It's still simple probability—desired outcomes over total outcomes—but figuring out the correct number of desired vs. total outcomes can be a little tricky.



EXAMPLE

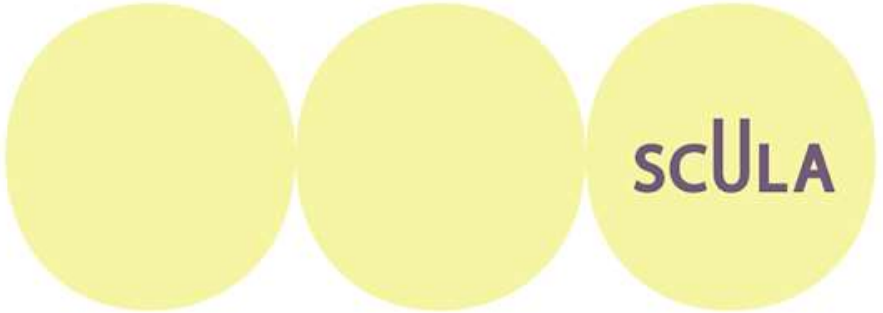
There are 100 people working on a performance: 52 dancers, 12 stage technicians, and 36 musicians. Among the dancers, 14 are ballet dancers, 20 are jazz dancers, and 18 are modern dancers.

What is the probability of selecting a ballet dancer from those working on the performance, given that the person selected is a dancer?

Solution

It might seem like this is asking you the probability of selecting a ballet dancer (of which there are 14) from everyone working on the performance (of which there are 100).

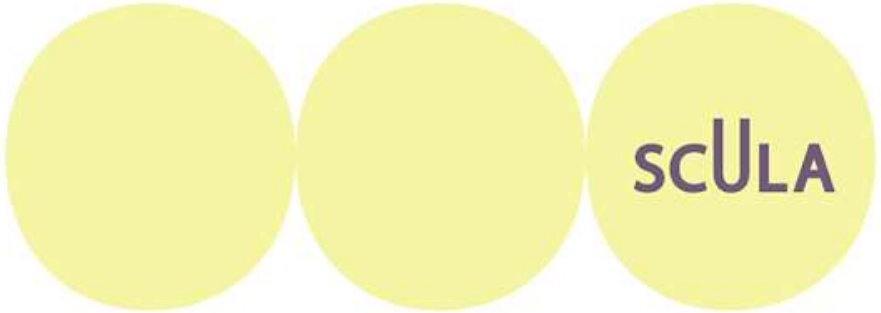
But actually, it's asking you the probability of selecting a ballet dancer from the dancers, because we are accepting as a given (as a condition) that the person we are randomly selecting is a dancer. We can tell this from the phrase "given that the person selected is a dancer."



Solution

Thus, we must calculate the probability of selecting a ballerina (Event B) given condition A, that the person we select will be from among the 52 dancers. So, the answer is 1452.

You can identify conditional probability questions because they will say "given" or some other word or phrase to indicate that there is some precondition being met ("provided that," "assuming," etc.).



PRACTICE

https://drive.google.com/file/d/1jQtJmfzjJOZlOe-05lVGMC3DiW5jnaFv/view?usp=drive_link

THANK YOU!

DO YOU HAVE ANY QUESTIONS?