

Activity Worksheet

Pool Testing

To detect steroid use in 200 athletes participating in a sports competition, their urine samples will be analyzed using the pool testing strategy. The samples will be combined in groups of 10 athletes.

It is known that the prevalence of steroid use in athletes in similar competitions, such as the 2018 Olympic Games, is 0,6%.

What is the probability that in a combined sample, at least one athlete will test positive for steroid use?

Activity 1

1. Consider the variable X = “number of positive individual samples in a combined sample” and answer:
 - a) What values can the variable X take?
 - b) Why X is a random variable?
 - c) Express in mathematical terms the probability corresponding to the problem question.

Activity 2

1. What is the probability that a combined sample will test positive?
2. What is the probability that there will be more than one person who used steroids in a combined sample who tested positive?
3. Of the $n = 20$ samples combined, how many are expected to be positive? Interpret the result.