

## Answer on Question #60241 – Math – Statistics and Probability

### Question

The batteries to the remote control for your television have just run out. You find your collection of miscellaneous "AA" batteries and grab 2 of them to replace the used ones. the box you used to fish out the replacements contained 14 batteries, but you were unaware that 5 of them were faulty and did not work.

Given that the remote control is now working what us the probability that the nest two batteries you select from your remaining stash will also work?

### Solution

The set of elementary events is  $\Omega = \{(B, B) | B \text{ is one of } 14 \text{ batteries}\}$ , hence  $|\Omega| = \binom{14}{2}$ ,

$A = \{(B, B) | B \text{ is one of that good batteries}\}$ . Then

$$|A| = \binom{14 - 5}{2} = \binom{9}{2}.$$

The probability that the remote control now works properly is

$$P_1 = \frac{|A|}{|\Omega|} = \frac{\binom{9}{2}}{\binom{14}{2}}$$

The probability that the nest two batteries you select from your remaining stash will also work is

$$P_2 = \frac{\binom{9 - 2}{2}}{\binom{14 - 2}{2}} = \frac{\binom{7}{2}}{\binom{12}{2}} = \frac{7!}{5!2!} = \frac{7 \cdot 6}{12 \cdot 11} = \frac{7}{22}$$

**Answer:**  $\frac{7}{22}$ .