Name: ________________________________

A student has to sell two books from a collection of 6 math, 7 science, and 4 economics books. Using a counting argument (i.e., count to get numerator and denominator), what is the probability that selling two randomly selected books will result in selling two books in the same subject?

Solution:

- The number of ways we could choose two math books is \( \binom{6}{2} = \frac{6 \times 5}{2} = 15 \). The number of ways we could choose two science books is \( \binom{7}{2} = \frac{7 \times 6}{2} = 21 \). The number of ways we could choose two econ books is \( \binom{4}{2} = \frac{4 \times 3}{2} = 6 \). The total number of ways to choose two books of the same kind is 42.

- The number of ways we could choose any two books is \( \binom{17}{2} = \frac{17 \times 16}{2} = 136 \).

- The probability of selling two books in the same subject is \( \frac{42}{136} = 0.309 \).