

PRACTICE DRILL 31—PROBABILITY

Lower, Middle, Upper

1. A basket of marbles contains 15 blue marbles. If the probability of not selecting a blue marble is $\frac{4}{9}$, how many marbles are in the basket?
2. A bowl of fruit contains 4 apples, 6 kiwis, and 5 oranges. If one fruit is selected from the bowl at random, what is the probability that it will be an apple or a kiwi?

Middle and Upper only

3. A box of cookies has 2 chocolate chip, 4 pecan, 7 oatmeal raisin, and 3 peanut butter cookies. If two cookies are selected at random, what is the probability that both cookies will be pecan?
4. A jar of cookies contains 5 chocolate chip, 4 oatmeal raisin, 4 snicker doodles, and 2 red velvet. Sandy chooses two cookies from the jar without replacement. What is the probability that she will choose a chocolate chip cookie first and a red velvet cookie second?

Practice Drill 31—Probability

1. 27

The question asks for how many marbles are in the basket. The probability of not selecting a blue marble is $\frac{4}{9}$, so the probability of selecting a blue marble is $1 - \frac{4}{9} = \frac{9}{9} - \frac{4}{9} = \frac{5}{9}$. Use the probability formula: $\text{probability} = \frac{\text{the number of what you want.}}{\text{the total number}}$

The probability is $\frac{5}{9}$, and the number of what you want is the number of blue marbles, which is 15. The question asks for the total number, so set this equal to x to get $\frac{5}{9} = \frac{15}{x}$. Cross-multiply to get $5x = 135$. Divide both sides by 5 to get $x = 27$.

2. $\frac{2}{3}$

The question asks for the probability that the fruit selected will be an apple or a kiwi, so get the sum of the probabilities that the fruit will be an apple and that the fruit will be a kiwi.

There is a total of $4 + 6 + 5 = 15$ pieces of fruit. There are 4 apples, so the probability that the fruit is an apple is $\frac{4}{15}$. There are 6 kiwis, so the probability that the fruit is a kiwi is $\frac{6}{15}$.

Therefore, the probability that the fruit is an apple or a kiwi is $\frac{4}{15} + \frac{6}{15} = \frac{10}{15} = \frac{2}{3}$.

3. $\frac{1}{20}$

The question asks for the probability that both cookies are pecan so multiply the probabilities that each individual cookie will be pecan. There are 4 pecan cookies and $2 + 4 + 7 + 3 = 16$ total cookies, so the probability that the first cookie will be pecan is $\frac{4}{16}$. Once one pecan cookie is removed, there are 3 remaining pecan cookies and 15 total cookies

remaining, so the probability that the second cookie will be pecan is $\frac{3}{15}$. Multiply the two to

get $\frac{4}{16} \times \frac{3}{15} = \frac{1}{4} \times \frac{1}{5} = \frac{1}{20}$.

4. $\frac{1}{21}$

On the first trial, Sandy chooses a chocolate chip cookie, which has a probability of $\frac{5}{15}$. On the second trial, she chooses a red velvet cookie. There are 2 red velvet cookies, but now there are only 14 cookies remaining in the jar to choose from. The probability for the second

trial is $\frac{2}{14}$. Multiply these together since these are independent of each other:

$$\frac{5}{15} \times \frac{2}{14} = \frac{1}{3} \times \frac{1}{7} = \frac{1}{21}.$$