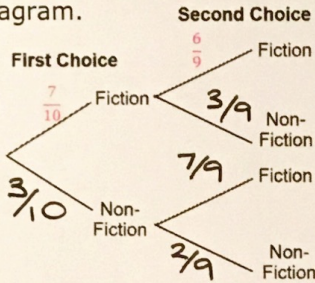# Tree Diagrams for Dependent Events

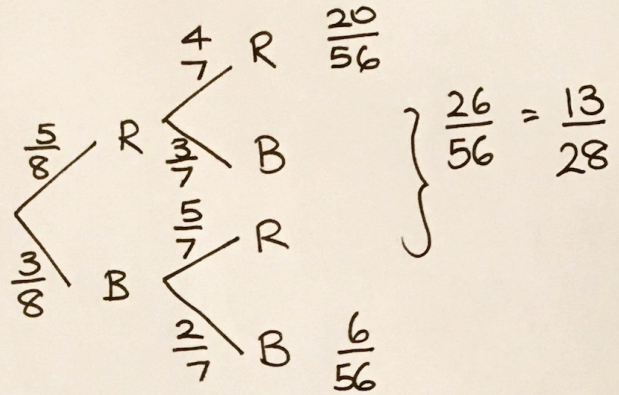A bookshelf contains three non-fiction books and seven fiction books. Bob chooses two books at random. Complete the tree diagram.
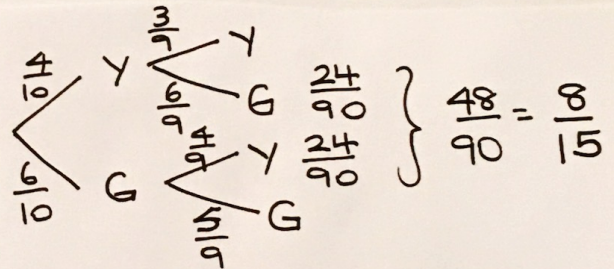
First Choice   **Second Choice**

$\frac{7}{10}$ Fiction

$\frac{6}{9}$ Fiction

$\frac{3}{9}$ Non-Fiction

$\frac{3}{10}$ Non-Fiction

$\frac{7}{9}$ Fiction

$\frac{2}{9}$ Non-Fiction

$$\frac{3}{10} \times \frac{2}{9} = \frac{6}{90} = \frac{1}{15}$$

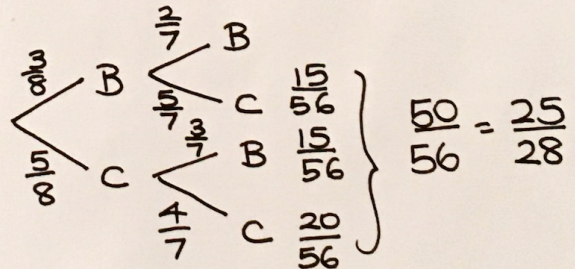Find the probability that Bob chooses two non-fiction books.

A drawer contains five red socks and three black socks. A sock is taken out at random and not replaced. A second sock is then taken out. Draw a tree diagram and calculate the probability that either a pair of red socks or a pair of black socks is chosen.

$\frac{5}{8}$ R

$\frac{4}{7}$ R $\frac{20}{56}$

$\frac{3}{7}$ B

$\frac{3}{8}$ B

$\frac{5}{7}$ R

$\frac{2}{7}$ B $\frac{6}{56}$

$\left.\right\} \frac{26}{56} = \frac{13}{28}$

A bag contains 4 yellow balls and 6 green balls. A ball is taken from the bag and not replaced. A second ball is then taken. Draw a tree diagram and find the probability that the two balls are different colours.

$\frac{4}{10}$ Y

$\frac{3}{9}$ Y

$\frac{6}{9}$ G $\frac{24}{90}$

$\frac{6}{10}$ G

$\frac{4}{9}$ Y $\frac{24}{90}$

$\frac{5}{9}$ G

$\left.\right\} \frac{48}{90} = \frac{8}{15}$

Amir has a biscuit tin containing 3 bourbons and 5 custard creams. He chooses a biscuit at random, eats it, then chooses another and eats that too. Draw a tree diagram and use it to find the probability that Amir has eaten at least one custard cream.

$\frac{3}{8}$ B

$\frac{2}{7}$ B

$\frac{5}{7}$ C $\frac{15}{56}$

$\frac{5}{8}$ C

$\frac{3}{7}$ B $\frac{15}{56}$

$\frac{4}{7}$ C $\frac{20}{56}$

$\left.\right\} \frac{50}{56} = \frac{25}{28}$

In a zoo, there are four elephants, three tigers and two giraffes. The zookeeper wants to choose two animals at random to take part in a promotional photo. Draw a tree diagram and use it to find the probability that the zookeeper chooses two of the same animal.

$\frac{4}{9}$ E

$\frac{3}{8}$ E $\frac{12}{72}$

$\frac{3}{8}$ T

$\frac{2}{8}$ G

$\frac{3}{9}$ T

$\frac{4}{8}$ E

$\frac{2}{8}$ T $\frac{6}{72}$

$\frac{2}{8}$ G

$\frac{2}{9}$ G

$\frac{4}{8}$ E

$\frac{3}{8}$ T

$\frac{1}{8}$ G $\frac{2}{72}$

$\left.\right\} \frac{20}{72} = \frac{5}{18}$