

1. Jane is given the following probability problem and her work is displayed. She has done something wrong. What did she do wrong and why is it wrong?

**Problem:** A bag of marbles has 3 green, 2 blue and 5 red marble. What is the probability of getting a red and then a green marble without replacement?

$$P(R \text{ and } G) = \left(\frac{5}{10}\right)\left(\frac{3}{10}\right) = \frac{15}{100}$$

2. Draw and completely label a Venn Diagram for each scenario. Determine the probability requested.

$P(A) = 0.3$        $P(B) = 0.15$

Events A and B are mutually exclusive.

$P(A \text{ or } B) = \underline{\hspace{2cm}}$

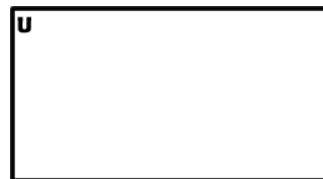


3. Given that events A and B are independent, Determine the probabilities. Draw and label a Venn diagram.

$P(A \text{ and } B) = 0.4$        $P(B) = 0.5$

$P(A) = \underline{\hspace{2cm}}$

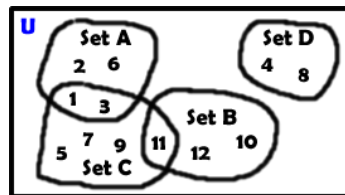
$P(A \text{ or } B) = \underline{\hspace{2cm}}$



4. Shade the required region in each Venn diagram and determine the requested probability.

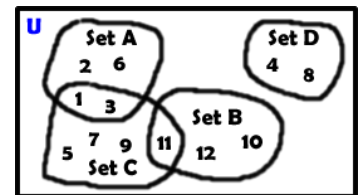
a) Shade  $P(C \text{ or not } B)$

$P(C \text{ or not } B) = \underline{\hspace{2cm}}$



b) Shade  $P(A \text{ and } D)$

$P(A \text{ and } D) = \underline{\hspace{2cm}}$



5. A bag of marbles has 15 red and 5 green. Two picks are made from the same bag without replacement. Draw your own tree diagram and label each branch with the probabilities.

6. Given two bags of marbles, bag #1 with 2 green, 3 red and 7 orange, and bag #2 with 5 green, 1 red and 4 orange. Determine the following probabilities.

a) Getting a red from bag #1 and then getting an orange from bag #1 **with** replacement.

b) Getting a red from bag #2 and then getting an orange from bag #2 **with** replacement.

c) Getting a green or a red from bag #2.

$P(R1 \text{ and } O1) = \underline{\hspace{2cm}}$

$P(R2 \text{ and } O2) = \underline{\hspace{2cm}}$

$P(G2 \text{ or } R2) = \underline{\hspace{2cm}}$

7. Given a standard deck of cards. Determine the probabilities.

a) Getting a numerical card less than 5 and then a king **with** replacement.

b) Getting a 2 and then a 2 **with** replacement.

c) Getting a spade or a 5.

$P(\# < 5 \text{ and King}) = \underline{\hspace{2cm}}$

$P(2 \text{ and } 2) = \underline{\hspace{2cm}}$

$P(\text{spade or } 5) = \underline{\hspace{2cm}}$

d) Getting a heart or a club.

e) Getting a red 2 followed by a black card **without** replacement.

f) Getting a face card followed by an second face card **with** replacement.

$P(\text{heart or club}) = \underline{\hspace{2cm}}$

$P(\text{red } 2 \text{ and black}) = \underline{\hspace{2cm}}$

$P(\text{face card and face card}) = \underline{\hspace{2cm}}$

8. A Jar of cookies have 12 chocolate chip cookies, 13 peanut butter cookies, and 5 walnut cookies. Beside the jar is a cookie sheet of 20 chocolate chip cookies.

Some unique replacement rules exist:

- if you pick a chocolate chip cookie from the jar you eat it and then replace it with 2 chocolate chip cookies from the cookie sheet.
- if you pick a peanut butter cookie you eat it
- if you pick a walnut cookie, you put it back.

a)  $P(\text{CC and then W}) = \underline{\hspace{2cm}}$

b)  $P(\text{CC and CC}) = \underline{\hspace{2cm}}$

c)  $P(\text{W and then W}) = \underline{\hspace{2cm}}$

d)  $P(\text{PB and then CC}) = \underline{\hspace{2cm}}$

e) Which has a greater chance of happening?  $P(\text{PB and then a W})$  or  $P(\text{W and then a CC})$ ?