1. A twelve-sided die (D12) is rolled.
   a. List the event "a multiple of 4 is rolled"

{4, 8, 12}

   b. List the complement of the event "a multiple of 3 is rolled"

{1, 2, 4, 5, 7, 8, 10, 11}

2. Box 1 has a blue (B), green (G), purple (P) and red (R) ball. Box 2 has a red (R), yellow (Y) and green (G) ball. One ball is picked from Box 1 then another ball from Box 2 at random.

   a. Draw a tree diagram to show the sample space

   b. Find the odds against "exactly one red ball is chosen" in lowest terms

#unfav : #fav

7 : 5

   c. Find the probability of "both balls are the same colour"

$\frac{2 \text{ fav}}{12 \text{ total}} = \frac{2}{12} =$ 16.67%

   d. Are the events "no red balls are chosen" and "exactly 1 red ball is chosen" complementary? Explain.

$P(1 \text{ red}) = \frac{5}{12}$

$P(\text{no red}) = \frac{6}{12}$

Don't add up to 100% = missing 2 Red

Not Complementary

3. Pre-season predictions are being made for the NFL. One commentator is predicting which teams will make the playoffs. According to her, the Seahawks have a 42% chance, the odds in favor of the 49ers making the playoffs is 4:5, and the odds against the Vikings is 11:9

a. Which team is most likely to make the playoffs?

Seahawks: 42%

49ers: $\frac{4}{9} = 44.44\%$

Vikings: $\frac{9}{20} = 45\%$

Vikings most likely

b. What are the odds in favor of the Seahawks making the playoffs (in lowest terms)?

$42\% = \frac{42}{100} = \frac{\#\text{fav}}{\text{total}}$

#fav : #unfav

42 : 58 = 21 : 29

4. A single card is drawn from a standard deck of cards. Use the formula to find the probability.

a. P(Jack U Red card)

$= P(\text{Jack}) + P(\text{red}) - P(\text{Jack} \cap \text{red})$

$= \frac{4}{52} + \frac{26}{52} - \frac{2}{52}$

$= 53.85\%$

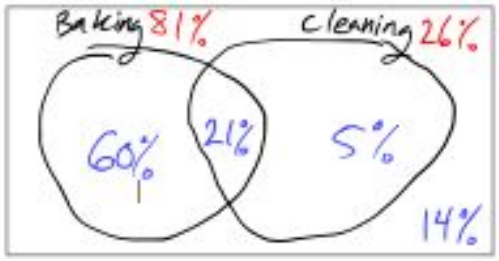
b. Are drawing a Jack and drawing a red card mutually exclusive? Explain how you know from you work in part a.

since $P(\text{Jack} \cap \text{Red}) \neq 0$

NOT Mutually exclusive

5. In a Lord Byng foods class, 81% of students like baking, 26% of students like cleaning dishes and 14% of students don't like baking or cleaning the dishes (and might want to consider a different elective...)

a. Draw a Venn Diagram (and fill it in as you go)



b. Find the probability a student chosen at random likes baking or cleaning dishes

$100\% - 14\% = 86\%$

c. Find the probability a student chosen at random likes baking and cleaning dishes

$P(\text{Bake} \cup \text{Dish}) = P(\text{Bake}) + P(\text{Dish}) - P(\text{Bake} \cap \text{Dish})$

$86\% = 81\% + 26\% - x \Rightarrow x = 21\%$

d. Find the probability a student chosen at random only likes cleaning dishes (...weird)

total cleaning = 26%

clean ∩ Dish = 21%

just clean = 26% − 21%

= 5%