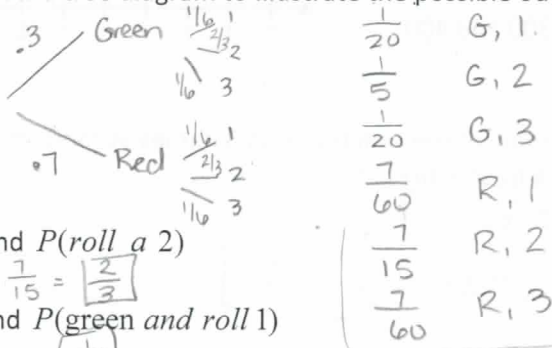


1) There is a bag that contains 3 green ball and 7 red balls. You reach into the bag and draw one of the balls. You then roll a 6-sided die that has the numbers 1, 2, 2, 2, 2, 3 on the sides.

a) Draw a tree diagram to illustrate the possible outcomes.



b) Find  $P(\text{roll a 2})$

$$\frac{1}{5} + \frac{7}{15} = \frac{2}{3}$$

c) Find  $P(\text{green and roll 1})$

$$\frac{1}{20}$$

d) Find  $P(\text{red or roll 3})$

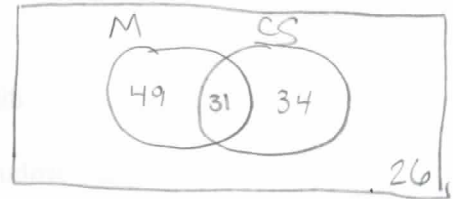
$$\frac{1}{20} + \frac{7}{60} + \frac{7}{15} + \frac{7}{60} = \frac{3}{4}$$

e) Find  $P(\text{red} | \text{roll 2})$

$$\frac{\frac{7}{15}}{\frac{1}{5} + \frac{7}{15}} = \frac{7}{12}$$

2) In a class of 140 students, 80 are taking math, 65 are taking computer science, and 31 are taking both.

Draw a Venn diagram that represents the situation. One student is picked at random. Find each probability.



a)  $P(\text{not taking math}) = \frac{60}{140} = \frac{3}{7}$

b)  $P(\text{taking math but not computer science}) = \frac{49}{140} = \frac{7}{20}$

c)  $P(\text{taking neither math nor computer science}) = \frac{26}{140} = \frac{13}{70}$

d)  $P(\text{taking math} | \text{taking computer science})$

$$\frac{31}{65}$$

3) There are a total of 100 students in grades ages 6, 7, and 8.

- 37 of these students are female.
- 11 6<sup>th</sup> graders are male.
- 21 7<sup>th</sup> graders are female.
- There are 30 8<sup>th</sup> graders, 18 are male.

	6 <sup>th</sup>	7 <sup>th</sup>	8 <sup>th</sup>	
M	11	34	18	63
F	4	21	12	37
	15	55	30	100

a) Construct a two-way table that represents the situation.

b)  $P(7\text{th grade}) = \frac{55}{100} = \frac{11}{20}$

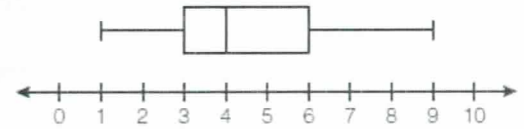
c)  $P(6\text{th grade} | \text{female}) = \frac{4}{37}$

d)  $P(\text{male} | 8\text{th grade}) = \frac{18}{30} = \frac{3}{5}$

4) A movie theater recorded the number of tickets sold daily for a popular movie during the month of June. The box-and-whisker plot shown below represents the data for the number of tickets sold, in hundreds.

Which conclusion can be made using this plot?

- A. The second quartile is 600.
- B. The mean of the attendance is 400.
- C. The range of the attendance is 300 to 600.
- D. Twenty-five percent of the attendance is between 300 and 400.**



5) There are 120 students on the Math Team and 50 are freshman. If the coach selects 3 names at random, with replacement, what is the probability that AT LEAST ONE is not a freshman?

$$P(\text{Frosh}) = \left(\frac{50}{120}\right)^3 = .0723$$

$$1 - P(\text{Frosh}) = 1 - .0723 = .928$$

6) The total number of points scored by both teams in each of the first 48 Super Bowl games are listed below. Find the 5-Number Summary and population standard deviation.

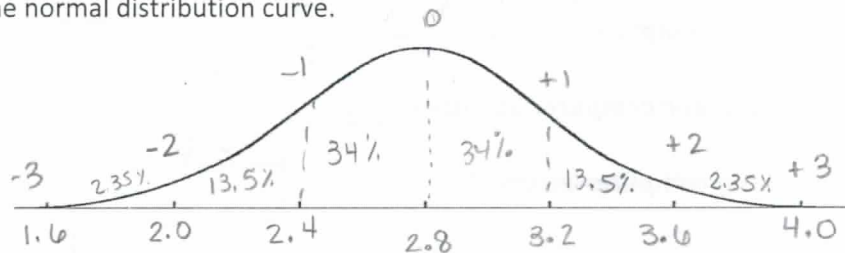
45, 47, 23, 30, 29, 27, 21, 31, 22, 38, 46, 37, 66, 50, 37, 47, 44, 47, 54, 56, 59, 52, 36, 65, 39, 61, 69, 43, 75, 44, 56, 55, 53, 39, 41, 37, 69, 61, 45, 31, 46, 31, 50, 48, 56, 38, 65, 51

Min 21  
Q1 37  
Med 46  
Q3 55.5  
Max 75

$$\sigma_x = 13.04$$

7) At a high school, GPA's are normally distributed with a mean of 2.8 and a standard deviation of 0.4.

a. Label the normal distribution curve.



b. About 95% of students at the high school will have a GPA between what 2 values?

2.0 and 3.6

c. Approximately what percent of the data should fall within 2.4 and 3.2?

68%

d. What percent of students have a GPA of 3.5 or higher?

$$\text{Normal Cdf}(3.5, 99, 2.8, .4) = 4\%$$

e. Find the z-score for a GPA of 3.7.

$$\frac{3.7 - 2.8}{.4} = 2.25$$

f. Find the range of GPAs for the middle 50%.

$$\text{InvNorm}(.25, 2.8, .4) = 2.53$$

$$\text{InvNorm}(.75, 2.8, .4) = 3.07$$

2.53 to 3.07