1. SUPPOSE A MOTHER IS ABOUT TO GIVE BIRTH TO 3 CHILDREN. WHAT ARE THE POSSIBLE OUTCOMES, ASSUMING EQUAL BIRHTS OR BOYS AND GIRLS?

Possible Outcomes: **BBB GGG BBG GGB**

Total number of Outcomes: **4**

There is 1/4 or 25% possibility per outcome

There is <u>25% chance</u> that the mother will give birth to either 3 Boys, 3 Girls, 2 Boys and a Girl, or 2 Girls and a Boy.

2. OF 75 APPLICANTS FOR A PROGRAMMING JOB, 20 ARE NOT COLLEGE GRADUATES. IF ONE APPLICANT IS SELECTED AT RANDOM, WHAT IS THE PROBABILITY THAT HE OR SHE IS NOT A COLLEGE GRADUATE?

Number of not college graduates: 20

Total number of Applicants: 75

20/75 = 0.2667 or 26.57% are not college graduates

There is <u>26.67% chance</u> that the selected applicant is not a college graduate.

3. IF <u>A</u> IS THE EVENT THAT A STUDENT WILL STAY HOME TO STUDY AND <u>B</u> IS EVENT THAT HE WILL INSTEAD GO TO A BEACH, AND P(A) = 0.64 AND P(B) = 0.21.

A.) WHAT IS THE P(A`)?

P(A) = 0.64

P(A`) = 1 – 0.64

P(A`) = 0.36

The value of P(A`) is 0.36.

B.) WHAT IS THE P(A OR B)?

P(A or B) = P(A) + P(B)

= 0.64 + 0.21

P(A or B) = 0.85

The value of P(A or B) is 0.85.

C.) WHAT IS THE P(A AND B)

P(A and B) = P(A) × P(B)

= 0.64 × 0.21

P(A and B) = 0.1344

The value of P(A and B) is 0.1344.

4. THREE TYPES OF SEEDS ARE PLANTED WITH A CHANCE OF GROWTH OF 1/8, 1/5, AND 1/10. WHAT ARE THE POSSIBILITIES THAT:

A.) THEY ALL GROW   **B.) ONLY ONE GROWS**   **C.) AT LEAST 1 TYPE GROWS**

Seed A: 1/8 = 0.125

Seed B: 1/5 = 0.2

Seed C: 1/10 = 0.1

a.) P(A and B and C) = P(A) × P(B) × P(C)

= 0.125 × 0.2 × 0.1

= 0.0025

A.) There is a probability of 0.25% for all the seeds to grow

b.) P(A or B or C) = P(A) + P(B) + P(C)

= 0.125 + 0.2 + 0.1

= 0.425

A.) There is 42.5% chance that only one seed will grow

c.) Probability of one seed to grow = 0.425

Probability of at least one is the complement of

P(A or B or C) = 1 – 0.425 = 0.575

C.) There is 57.5% chance that at least one seed will grow

5. INDICATE WHICH RULES OF PROBABILITY ARE VIOLATED BY THE FOLLOWING STATEMENTS:

A) THE PROBABILITY THAT A CERTAIN PRODUCT WILL BE SOLD AT A FAIR IS 0.14 AND THE PROBABILITY THAT IT WILL BE SOLD IS 0.92.

The probability of selling the product is already 0.14 and it mus not be also 0.92 because there cannot be two possibilities fo a single event. Instead, it can be changed to be it's complement saying that the probability of selling the product is 0.14 and there is 0.86 probability that it won't be solved.

B) THE PROBABILITY THAT A CUSTOMER IN A STORE WILL PURCHASE AT LEAST 1 ITEM IS 0.60, WHILE THE PROBABILITY THAT A CUSTOMER WILL PURCHASE 2 OR MORE ITEMS IS 0.70.

A customer already has 0.60 probability to buy at least one item so in reality, buying 2 or more items has lesser probability, cannot be .70 or any value higher, meaning that it should be less than 0.60.

C) SINCE THERE IS NO CLOUD IN THE SKY, THE PROBABILITY THAT IT WILL RAIN LATER ON IN THE DAY IS –0.90.

Instead of using –0.90, its likely more believable to use a positive-valued percentage or probability instead of a negative value. Hence, it is appropriate to say that there is 0.10 chance of raining considering that there are no clouds in the sky.