**Module 4**

1. Two friends, friend 1 and friend 2 appear in an interview for two vacancies for the same post. The probability of friend 1 getting selected is (1/7) and the probability of friend 2 getting selected is (1/5). What is the probability that only one of them is selected ?

We need to find the probability that only one of friend 1 or friend 2 gets selected.

This can happen in two scenarios: either friend 1 is selected and friend 2 is not, or vice versa.

Probability that only friend 1 is selected: 𝑃(Friend 1 only)=𝑃(Friend 1)×(1−𝑃(Friend 2))P(Friend 1 only)=P(Friend 1)×(1−P(Friend 2))

Probability that only friend 2 is selected: 𝑃(Friend 2 only)=(1−𝑃(Friend 1))×𝑃(Friend 2)P(Friend 2 only)=(1−P(Friend 1))×P(Friend 2)

Then, we add these probabilities together.

𝑃(Only one of them is selected)=𝑃(Friend 1 only)+𝑃(Friend 2 only)P(Only one of them is selected)=P(Friend 1 only)+P(Friend 2 only)

𝑃(Only one of them is selected)=1/7×(1−1/5)+(1−1/7)×1/5

𝑃(Only one of them is selected)= 5/35+6/35=11/35

1. Find the determinant of [1,3,2]

[ -3,-1,-3]

[ 2,3,1]

det=1((−1)(1)−(−3)(3))−3((−3)(1)−(−3)(2))+2((−3)(3)−(−1)(2))

det=1(−1+9)−3(−3+6)+2(−9+2)

det=8+9−14

det=3

1. If a number is picked at random from a set {1, 2, 3, ...., 70}, then the probability that the picked number is a cube?

There are 70 numbers in the set, and the cubes are 4 numbers.

So, there are 4 cube numbers in the set {1, 2, 3, ..., 70}.

Therefore, the probability of picking a cube number is 4/70=2/35​.

1. If two dice are thrown together, what is the probability of getting an odd number on one dice and an even number on the other dice?

On a fair six-sided die, there are 3 odd numbers (1, 3, 5) and 3 even numbers (2, 4, 6).

The probability of getting an odd number on one die is 3/6=1/2​, and the probability of getting an even number on the other die is also 3/6=1/2​.

Since these events are independent, we multiply the probabilities: 1/2×1/2=1/4

1. Ajay took two tests. The probability of him passing both tests is 0.6. The probability of him passing the first test is 0.7. What is the probability of him passing the second test given that he has passed the first test?

𝑃(passing both tests)=0.6P(passing both tests)=0.6

𝑃(passing the first test)=0.7P(passing the first test)=0.7

𝑃(passing the second test∣ passing the first test) be the probability of passing the second test given that he has passed the first test (which we need to find).

Using the formula for conditional probability:

𝑃(passing the second test∣passing the first test)=

𝑃(passing both tests)/ 𝑃(passing the first test)

𝑃(passing the second test∣passing the first test)=P(passing the first test)P(passing both tests)​ ≈0.857