If X~N(μ .σ) follows a normal distribution with unkown parameters, means and standard deviation, ans also $P(X<10)=P(X>30)=0.2$ then find the mean and standard deviation

If $X \sim N(\mu,\sigma)$ follows a normal distribution with unknown parameters and $P(X < 10) = P(X > 30) = 0.2$, then we can use the standard normal distribution table or a calculator to find that these probabilities correspond to Z-scores of -1.28 and 1.28, respectively, where $Z = (X-\mu)/\sigma$ is the standard score or Z-score.

Using the property of normal distribution $P(X<a) = P(X>-a)$ for any value of a, we can use this equation to find the values of X in terms of Z-scores:

$X = \mu + Z\sigma$

So, $X = 10$ corresponds to $Z = -1.28$ and $X = 30$ corresponds to $Z = 1.28$

Now we can use these equations to find the mean and standard deviation:

$10 = \mu - 1.28\sigma$ $30 = \mu + 1.28\sigma$

Solving this system of equations, we get:

$\mu = 20$, $\sigma = (30-10)/(1.28*2) = 5$

So the mean and standard deviation of the distribution are 20 and 5, respectively.

there is a class with three asian students , two ethiopian students, and four american students. what is the probability that all members of a committee of size three will be asian?

(3/9) * (2/8) * (1/7) = 6/504 = 1/84

This is because there are 3 Asian students out of 9 total students in the class. Once one Asian student is chosen for the committee, there are only 2 Asian students left out of 8 total remaining students. And, if one more Asian student is chosen, there is only 1 Asian student left out of 7 total remaining students. So the probability of choosing an Asian student on each selection is 3/9, 2/8, and 1/7 respectively. And the final result is obtained by multiplying the probabilities.

if we choose to replace them , then find the probability of selecting all asians. (i,e., one person can be selected twice)

If we choose to replace the balls after each selection, we can use the formula for combination with replacement to calculate the probability of selecting all Asians.

The probability of selecting all Asians is: (3/9) * (3/9) * (3/9) = 27/729

This is because each time we draw a ball from the bag, the probability of selecting an Asian student is 3/9, and since we are replacing the ball after each draw, the probability of selecting an Asian student remains the same for each draw. So, we multiply this probability 3 times which gives us the final probability of 27/729

It is worth noting that the combination with replacement is different from the combination without replacement because it allows the same elements to be chosen multiple times and the order of the combination doesn't matter either.

what is the probability that the third one will be tha first asian? (with replacement)

The probability that the third person selected will be the first Asian student, given that replacement is allowed, is (3/9) as the first person selected can be any of the nine students in the class, and since we are replacing the student after selecting, the first student selected can also be an Asian student.

what is the probability that everyone on this committee is of a different nationality? (one will be asian, another ethiopian , and one american.)

To find the probability that everyone on this committee is of a different nationality, we will use the formula for combination.

The first member of the committee can be selected from 3 Asian students, the second member can be selected from 2 Ethiopian students and the third member can be selected from 4 American students.

So the probability of selecting one Asian student, one Ethiopian student, and one American student is:

(3C1 * 2C1 * 4C1) / (9C3) = (324) / 84 = 2/7

So, the probability that everyone on this committee is of a different nationality is 2/7.

To determine the entrance fee for the game to be fair, we need to calculate the expected value (EV) of the game. The expected value is the sum of the product of each possible outcome and its corresponding probability.

Given that, the probability of moving the ball from the first bag to the second bag is:

P(Black) = 4/9 P(Yellow) = 3/9 P(Red) = 2/9

Then the second bag will have:

P(Black in Second Bag) = 3/9 + 4/9 = 7/9 P(Yellow in Second Bag) = 2/9 + 3/9 = 5/9 P(Red in Second Bag) = 3/9 + 2/9 = 5/9

and the probability of drawing a black ball from the second bag is 7/9, yellow 5/9 and red 5/9

EV = -10(7/9) + -20(5/9) = -70/9 = -7.78

Since the expected value is negative, it means that the game is unfair to the player and the entrance fee should be greater than -7.78 dollars to make it fair.

So the entrance fee should be greater than -7.78 dollars to make the game fair