1. As voters exit the polls, you ask a representative random sample of 6 voters if they voted for proposition 100. If the true percentage of voters who vote for the proposition is 55.1%, what is the probability that, *in your sample,* exactly 2 voted for the proposition and 4 did not?

**Answer:**

Since, this follows a Binomial distribution, the formula to be used is

P(X=x) = (nCx) **\*** p^x **\*** (1-p)^(n-x)

n = 6

x = 2

p = 0.551

Based on the above formula, the probability is 18.51%

1. Professor Willoughby is marking a test. Here are the students’ results (out of 60 points): 20, 15, 26, 32, 18, 28, 35, 14, 26, 22, and 17. Most students didn't even get 30 out of 60, and most will fail. The test must have been really hard, so the Prof decides to standardize all the scores and only fail people 1 standard deviation below the mean. So who will fail?

**Answer:**

|  |  |  |  |
| --- | --- | --- | --- |
| x | Mean | Dev from Mean | Diff from 1 SD |
| 20 | 23 | 87% | 18.96% |
| 15 | 23 | 65% | -2.78% |
| 26 | 23 | 113% | 45.04% |
| 32 | 23 | 139% | 71.13% |
| 18 | 23 | 78% | 10.26% |
| 28 | 23 | 122% | 53.74% |
| 35 | 23 | 152% | 84.17% |
| 14 | 23 | 61% | -7.13% |
| 26 | 23 | 113% | 45.04% |
| 22 | 23 | 96% | 27.65% |
| 17 | 23 | 74% | 5.91% |

So the students, who have scored 15 and 14 will fail