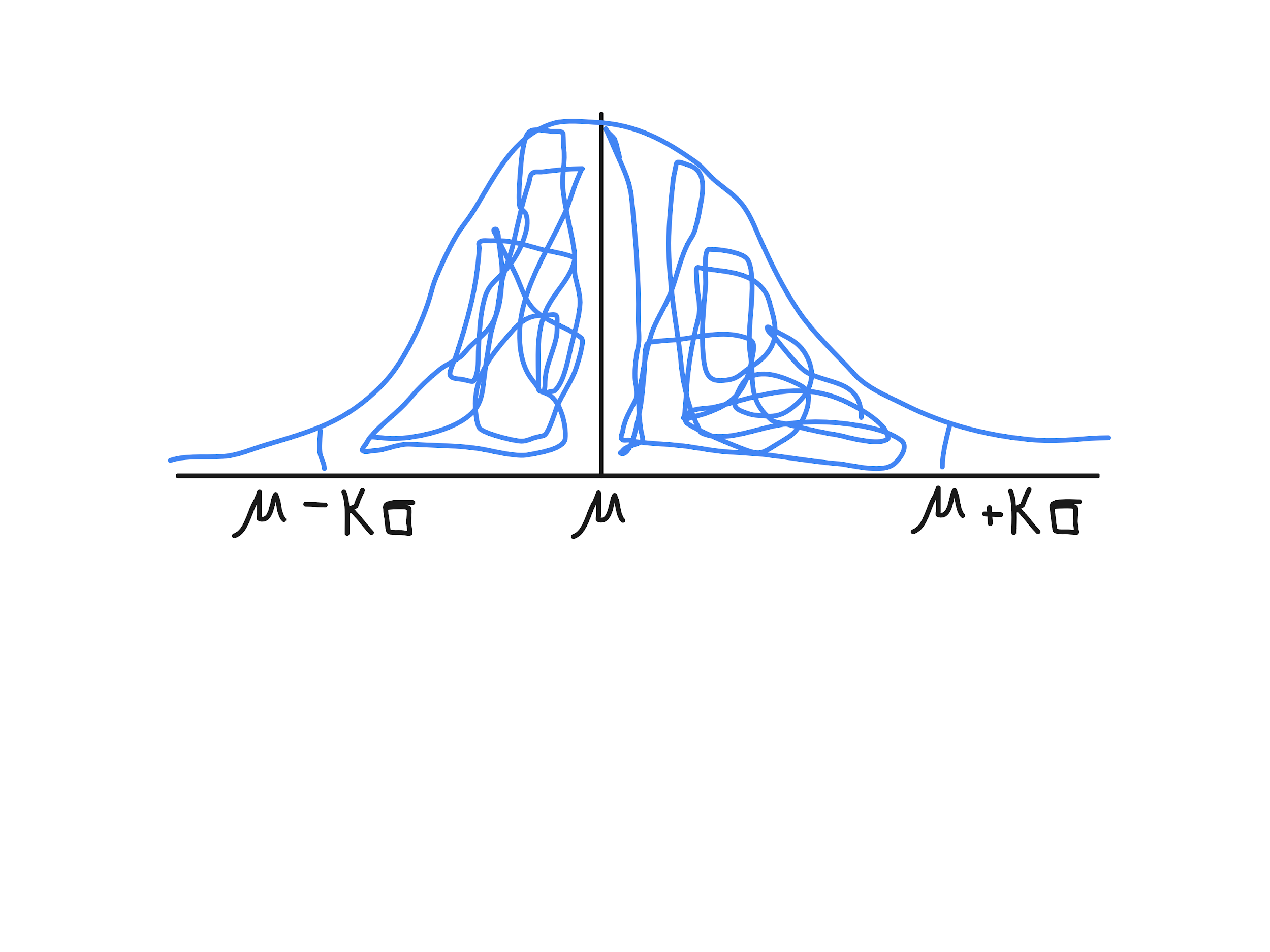
1. We need to solve for the expected value and variance of using the knowledge that . , . Using this we can now work forwarded from the provided inequality, . We now need to show the best way to choose n so that the probability is at least . .
2. 
3. Based on the graph in (b) we know that where z is a normally distributed random variable between 0 and 1. Given this the previous probability is greater than or equal to. . So we get the required inequality of .
4. .

|  |  |  |
| --- | --- | --- |
|  |  |  |
| 0.1 | 10 | 2.7 |
| 0.05 | 20 | 3.8 |
| 0.01 | 100 | 6.6 |
| 0.005 | 200 | 7.9 |
| 0.001 | 1000 | 10.5 |

1. It is very conservative because given a certain alpha value the Chebyshev Inequality uses way more samples than a normal distribution.