a)

The Senate has 100 seats. 42 Republicans (R) seats are **not** up for reelection. 23 Democrats (D) seats are **not** up for reelection. 35 seats are up for reelection. The range for variable R is [42, 77].

c)

Undecided voters will vote for the two candidates with the ratio p1/p2. 3 Republicans are “safe”. 13 Democrats are “safe”. R:[45, 64]. pR>0.5 doesn’t indicate that the Republican is expected to win that race.

d)

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| State |  | % undecided in original poll | Asymptotic standard deviation of | the Margin of Error (MOE) of the poll | probability of Republican win in State using the asymptotic distribution | the worst of the self reported σP for the State and 0.026 |
| Arizona | 0.47 | 5% | 0.014 | 0.027 | 0.03 | 0.014 |
| Florida | 0.48 | 10% | 0.010 | 0.019 | 0.01 | 0.010 |
| Indiana | 0.52 | 5% | 0.013 | 0.026 | 0.88 | 0.013 |
| Michigan | 0.45 | 6% | 0.018 | 0.035 | 0.00 | 0.018 |
| Minnesota | 0.47 | 12% | 0.019 | 0.037 | 0.03 | 0.019 |
| Mississippi | 0.57 | 33% | 0.027 | 0.052 | 0.99 | 0.026 |
| Missouri | 0.52 | 5% | 0.012 | 0.024 | 0.90 | 0.012 |
| Montana | 0.47 | 6% | 0.015 | 0.029 | 0.02 | 0.015 |
| Nebraska | 0.58 | 7% | 0.020 | 0.038 | 1.00 | 0.020 |
| Nevada | 0.53 | 12% | 0.016 | 0.031 | 0.98 | 0.016 |
| New Jersey | 0.47 | 11% | 0.021 | 0.040 | 0.09 | 0.021 |
| New Mexico | 0.41 | 21% | 0.015 | 0.030 | 0.00 | 0.015 |
| North Dakota | 0.54 | 0% | 0.013 | 0.025 | 1.00 | 0.013 |
| Ohio | 0.45 | 17% | 0.014 | 0.028 | 0.00 | 0.014 |
| Tennessee | 0.52 | 4% | 0.015 | 0.028 | 0.92 | 0.015 |
| Texas | 0.53 | 3% | 0.015 | 0.030 | 0.95 | 0.015 |
| West Virginia | 0.47 | 8% | 0.015 | 0.029 | 0.01 | 0.015 |
| Wisconsin | 0.42 | 7% | 0.015 | 0.029 | 0.00 | 0.015 |

1 poll is reporting an MOE better than 5%.