Basic R Commands Explained

\*note: all commands with ‘norm’ apply to normally distributed data only

| COMMAND | FORMAT | EXAMPLE |
| --- | --- | --- |
| pnorm | pnorm(x, μ, σ) | Find the probability of a score of 80 or lower on a test with a mean of 75 and a standard deviation of 5. P[x≤80]  > pnorm(80,75,5,lower.tail=TRUE)  [1] 0.8413447  Find the probability of a score of 80 or higher on a test with a mean of 75 and a standard deviation of 5. P[x≥80]  > pnorm(80,75,5,lower.tail=FALSE)  [1] 0.1586553 |
|  | pnorm(z) | Find the probability of a variate being at or below a z-score of -1.2, P[x≤1.2]  > pnorm(-1.2,lower.tail=TRUE)  [1] 0.1150697  Find the probability of a variate being at or above a z-score  of -1.2, P[x≥-1.2]  > pnorm(-1.2,lower.tail=FALSE)  [1] 0.8849303 |
| qnorm | qnorm(p, μ, σ) | Bob wants to score in the 80th percentile on his Stats exam. If the mean score is 67 and the standard deviation is 3.1, what score will he need?  > qnorm(.8,67,3.1,lower.tail=TRUE)  [1] 69.60903 |
|  | qnorm(p) | Find the z-score corresponding to a probability of .75 (75%)  > qnorm(.75,lower.tail=TRUE)  [1] 0.6744898 |
| dbinom | dbinom(x, n, p) | An electronics company produces transistors. It is known that 2% of all transistors produced are defective. Each package contains 250 transistors. What is the probability that a randomly selected package will contain **exactly** 3 defective transistors? P[x=3]  > dbinom(3,250,0.02,)  [1] 0.1400782 |
| pbinom (no more than) | pbinom(x,n,p) | An electronics company produces transistors. It is known that 2% of all transistors produced are defective. Each package contains 250 transistors. What is the probability that a randomly selected package will contain **no more than** 3 defective transistors? P[x≤3]  > pbinom(3,250,0.02,lower.tail=TRUE)  [1] 0.2621919 |
| Pbinom (a number or more) | pbinom(x,n,p) | An electronics company produces transistors. It is known that 2% of all transistors produced are defective. Each package contains 250 transistors. What is the probability that a randomly selected package will contain **3 or more** defective transistors? P[x≥3]  > pbinom(3,250,0.02,lower.tail=FALSE)  [1] 0.7378081 |
| Prop.test | prop.test(x, n, p = NULL) | 1) The average failure rate for students taking PHYS101 is 20%. This semester, 2 out of the 15 students in the class failed the course. Find the p-value for the hypothesis test that this semester’s students have performed significantly better than average.  > prop.test(2,15,p=0.2,alternative=”greater”)  1-sample proportions test with continuity correction  data: 2 out of 15, null probability 0.2  X-squared = 0.10417, df = 1, p-value = 0.6266  alternative hypothesis: true p is greater than 0.2  95 percent confidence interval:  0.02887814 1.00000000  sample estimates: p 0.1333333  2) The average failure rate for students taking PHYS101 is 20%. This semester, 4 out of the 15 students in the class failed the course. Find the p-value for the hypothesis test that this semester’s students have performed significantly worse than average.  > prop.test(4,15,p=0.2,alternative=”less”)  1-sample proportions test with continuity correction  data: 5 out of 15, null probability 0.2  X-squared = 0.9375, df = 1, p-value = 0.8335  alternative hypothesis: true p is less than 0.2  95 percent confidence interval:  0.00000000 0.5765152  sample estimates: p 0.3333333 |