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|  | **Cube** | **Cylinder** |
| **Red** | 10 | 30 |
| **Blue** | 20 | 15 |

1. Following table presents frequencies of objects with regard to shape and color. Is there any association between color and the shape of the objects?
2. Suppose there are n observations , with mean . When a new observation is added to the dataset, the value of the new mean is . Show that the change in mean, when the new observation xn+1 is added, is proportional to the difference between and with the proportionality constant is .
3. X and Y are continuous variables both with the same mean and no skewness. X has a higher variance then Y.

a) Draw typical distributions of X and Y on the same graph.

b) Draw box plots of X and Y on the same graph.

1. For a student studying 10 terms in a university, her GPA falls in the first 4 terms then remains the same for the next 2 terms and finally increases in the last 4 terms. Assume that the students gets the same number of credits in each term and does not repeat any courses.
   1. Draw a possible GPA versus term graph: evolution of her GPA over time
   2. Draw a compatible SPA (semester point average) graph as a function of term on the same graph compatible with her GPA