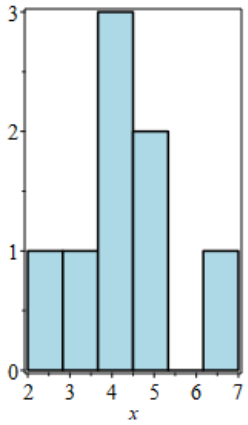
Pr.24.2

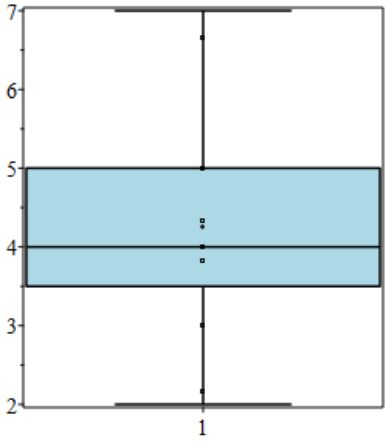
```
> S := [4, 2, 4, 5, 3, 7, 5, 4]:
> S := sort(S);                                  # Resp. S := [2,3,4,4,4,5,5,7]
> with(Statistics):
> xbar := evalf[6](Mean(S));                     # Resp. xbar := 4.25000
> xtilde := Median(S);                           # Resp. xtilde := 4.0
> evalf[4](StandardDeviation(S));                # Resp. 1.488
```

Pr 24.4

```
> S := [4, 2, 4, 5, 3, 7, 5, 4]:
> with(Statistics):
> [Sort(S)[1], Quartile(S, 1), Quartile(S, 2), Quartile(S, 3), Sort(S, order
      = descending)[1]];
                    [2, 3.41666666666667, 4., 5., 7]
> Histogram(S, bincount = 6, frequencyscale = absolute, labels = [x, " "], color
      = "LightBlue");
```




```
> BoxPlot(S, color = "LightBlue");
```



Pr.24.6 Assume independence. 99.49% (practically 99.5%) follows from the response (10 roots, one positive real) of

```
> solve(p^10 = 0.95, p);
```

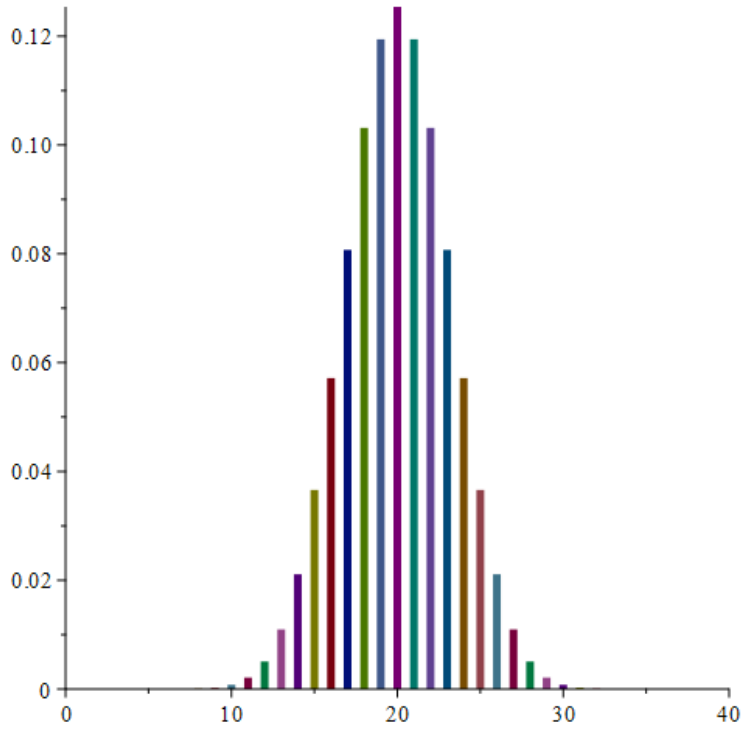
We can extract an interval (to a specified accuracy) for the real roots with `realroot`. Because this command requires integer coefficients the equation is multiplied by 100.

```
> evalf(realroot(100*p^10 - 95, 1/100000));
```

$$[[-0.99489, -0.99488], [0.99488, 0.99489]]$$

Pr.24.8 Symmetry with respect to the mean 20 because the probability of failure is also 1/2. The graph is reminiscent of the density of the normal distribution with mean 20 and variance $np(1-p) = 10$, illustrating the DeMoivre-Laplace limit theorem. Very small probabilities for x from 0 to 10 and from 30 to 40.

```
> f := seq(ProbabilityFunction('BinomialDistribution'(40, 0.5), x), x = 0 ..40) :
> s := seq([[j - 1, 0], [j - 1, f[j]]], j = 1 ..41) :
> plot({s}, thickness = 5)
```



Pr.24.14

```
> with(Statistics):  mu := 116:  sd := 6:
> evalf[5](CDF('Normal'(mu, sd), 122.5));                  # Resp. 0.86067
> 1 - evalf[5](CDF('Normal'(mu, sd), 110));                # Resp. 0.84134
> evalf[5](CDF('Normal'(mu, sd), 121.25))
    - evalf[5](CDF('Normal'(mu, sd), 120.5));              # Resp. 0.03584
```