Mean, median & mode

Problems:

1. 20 students, graduates and undergraduates were enrolled in a statistics course, ages -
   18, 19, 19, 19, 19, 20, 20, 20, 20, 20, 21, 21, 21, 21, 22, 23, 24, 27, 30, 36

a) Mean and median of all students

b) Median age of all students under 25

c) Modal age of all students

ans

```
x = c(18,19,19,19,19,20,20,20,20,20,21,21,21,21,22,23,24,27,30,36)
> mean(x)
[1] 22
> median(x)
[1] 20.5
> y = x[x<25]
> median(y)
[1] 20

> t = table(x)
> which(t == max(t))
20
3
```

5. Quality control engineer is interested in determining whether the machine is adjusted to dispense 16 ounces of sugar. Following data refer to the net weight packed in '31-pound-bags' after the machine was adjusted. Calculate measures of skewness & kurtosis

ans

```
> x = c(15.9, 16.2, 16, 15.6, 16.2, 15.9, 16, 15.6, 15.6, 16, 16.2, 15.6, 15.9, 16.2,
  15.6, 16.2, 15.8, 16, 15.8, 15.9, 16.2, 15.8, 15.8, 16.2, 16, 15.9, 16.2, 16.2, 16, 15.6)
> n = length(x)
> n
 [1] 30
> mean = mean(x)
> mean
 [1] 15.93667
> m4 = sum((x-mean)^4)/n
> m4
 [1] 0.004062022
> m2 = var(x)
> m2
 [1] 0.0486092
> beta2 = m4/(m2^2)
> beta 2
 [1] 1.719117
> gamma2 = beta2 - 3
> gamma2
 [1] -1.280833
```

x——x-x-x——x

3. An entomologist studying morphological variation in species of mosquito recorded following data on body length : 1.2, 1.4, 1.3, 1.6, 1, 1.5, 1.7, 1.1, 1.2, 1.3. Compute all measures of distribution

ans

```
> x= c(1.2, 1.4, 1.3, 1.6, 1, 1.5, 1.7, 1.1, 1.2, 1.3)
> summary(x)
```

Min	1st Qu	Median	Mean	3rd Qu	Max
1.000	1.200	1.300	1.330	1.475	1.700

```
> var(x)
[1] 0.049
> sd = sqrt(var(x))
> sd
[1] 0.2213594
> cqd = (1.475-1.2)/(1.475+1.2)
> y= (x-mean(x))
> y= abs(y)
> md1 = sum(y)/length(y)
> md1
[1] 0.176

> z = abs(x-median(x))
> md2 = sum(z)/length(z)
> md2
[1] 0.17
```

x - - - - - - - - - - - - - - x