Name: _____

Statistics Date: _____

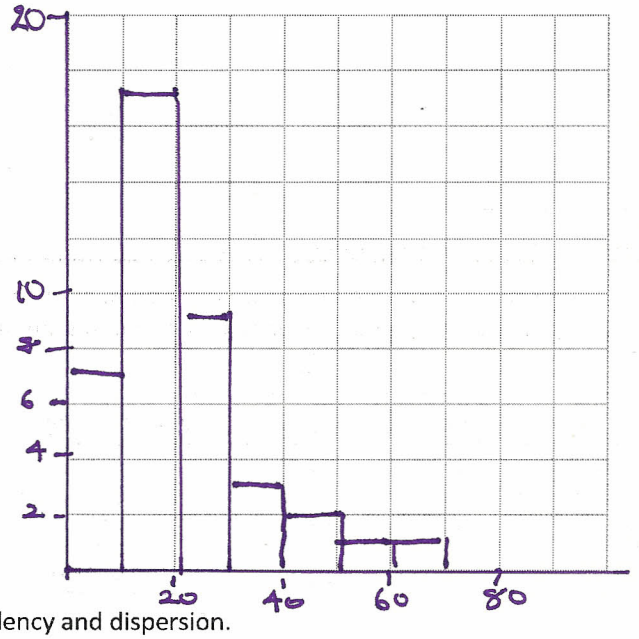
1. A manufacturer of minicomputers is investigating the down time of its systems. The 40 most recent customers were surveyed to determine the amount of down time (in hours) they had experienced during the previous month. The survey data is listed below

12	16	5	16	21	29	38	15	47	0
24	15	13	8	2	11	22	17	31	10
4	10	15	7	20	9	22	18	28	19
34	26	17	11	64	19	18	24	49	50

a. Create a frequency table for the data.

Hours	TALLY	Frequency
[0,10)	~~IIII~~ II	7
[10,20)	~~IIII~~ ~~IIII~~ ~~IIII~~ II	17
[20,30)	~~IIII~~ IIII	9
[30,40)	III	3
[40,50)	II	2
[50,60)	I	1
[60,70)	I	1

b. Create a histogram of the data.

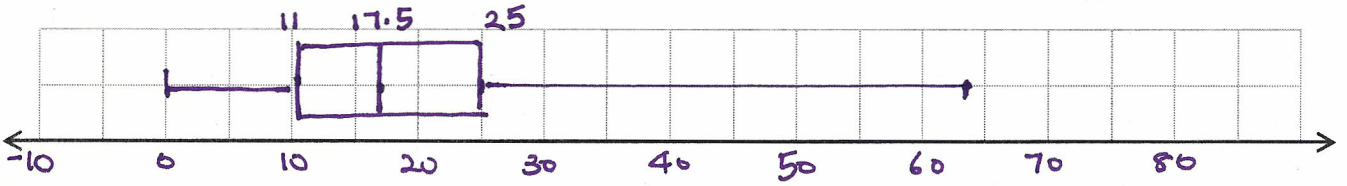


c. Find the following descriptive statistics of central tendency and dispersion.

$\bar{x}$ = 20.4 Mode = 15 Min = 0 Q1 = 11 Median = 17.5 Q3 = 25 Max = 64

σ = 13.7 Range = 64 IQR = 14

d. Create a box plot for the data



e. Describe the shape, center, and spread of the data.

Data has a large spread because of outliers.

Shape is skewed right.

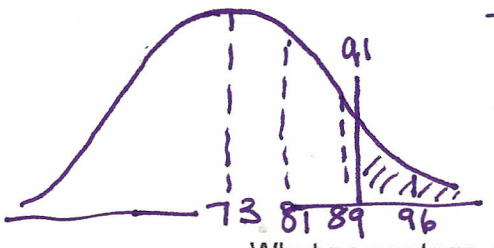
mode < median < mean

Normal and Standard Normal Distributions

For each section, draw the normal curve, shade the area under the curve to represent each question.

A set of final examination scores in a calculus course was found to be normally distributed with a mean of 73 and standard deviation of 8.

- What proportion of students earned at most a grade of 91 on the exam?



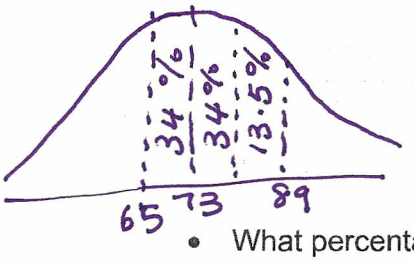
Ti-84

$\boxed{2^{nd}}$ $\boxed{VARS}$ $\boxed{2}$

normalcdf(91,999,73,8) = $\boxed{0.012}$

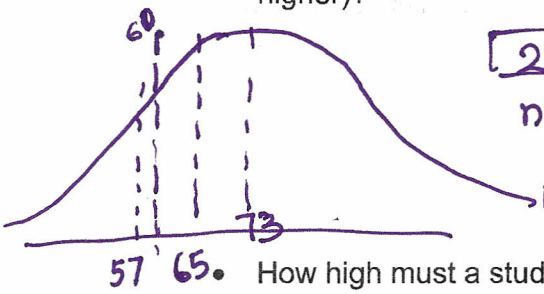
Nspire: $\boxed{Menu}$ → 6. Statistics → 5. Distributions → 2. Normal cdf → $\boxed{Enter}$

- What percentage of students scored between a 65 and 89 on the exam?



34 + 34 + 13.5 = 81.5 %

- What percentage of students scored earned a passing score on the exam (60 or higher)?



Ti 84

$\boxed{2^{nd}}$ $\boxed{VARS}$ $\boxed{2}$

normalcdf(60,999,73,8) ≈ 0.9479

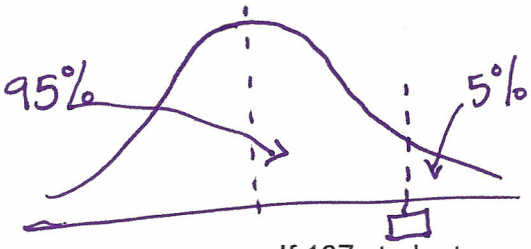
$\boxed{94.79\%}$

Nspire:

$\boxed{menu}$ → 6. Stat → 5. Distr → Normalcdf → Enter.

Lower bound: 60 Upper Bound: 999 $\mu = 73$ $\sigma = 8$

- How high must a student score in order to place in the top 5% of all students?



95th Percentile.

$\boxed{2^{nd}}$ $\boxed{VARS}$ $\boxed{3}$

* InvNorm(0.95, 73, 8) = $\boxed{86.16}$

- If 137 students are taking Calculus, how many do you expect would earn a passing score on the exam?

Since 94% of students earned a passing score or highe.

94% of 137 students

(0.94)(137) = 128 students

Z-scores & InvNorm

1. A university gives an admission qualifying exam. The results are normally distributed with a mean of 500 and a standard deviation of 100.

Using the chart below, find the students score that would represent the given percentile.

Ti-84
[2nd] [VARS] [3]
Invnorm:

Nspire
[Menu] → 6. Statistics →
5. Distributions → Invnorm

Percentile	Students Score
25th	432.55
50th	500
75th	567.45
90th	628.16

The admissions department would like to accept only students who score in the 65th percentile or better. Determine what score is associated with the 65th percentile and which students would qualify for admission?

Invnorm (0.65, 500, 100) = 538.33
A score above 538.53

2. The MP3 player made by Mango Corp., has an average battery of 400 hours. Battery life for the Mango Corp. MP3 player is normally distributed with a standard deviation of 25 hours. The MP3 player made by Pineapple Inc., has an average battery life of 390 hours. The distribution for its battery life is also normally distributed with a standard deviation of 30 hours.

$\bar{x}_m = 400 \quad \sigma = 25$

$\bar{x}_p = 390 \quad \sigma = 30$

data mean

$Z = \frac{x - \mu}{\sigma}$

- Find the z- score for each battery with lives of 410 hours.

$Z_p = \frac{x - 390}{30} \quad Z_p = \frac{410 - 390}{30} = \frac{2}{3} \quad Z_m = \frac{410 - 400}{25} = \frac{2}{5}$

- Which battery lasting 410 hours performed better? Explain your answer.

Mango corp's battery. Smaller z score means less deviations away from mean.

- What battery life for the Mango Corp would represent the 95th percentile?

Inv. Norm (0.95, 400, 25) = 441.12