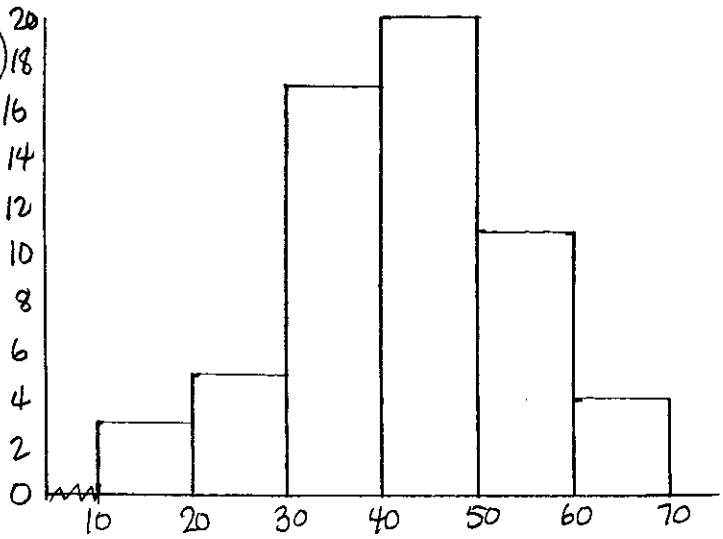
5.4 Foundations of Math 11

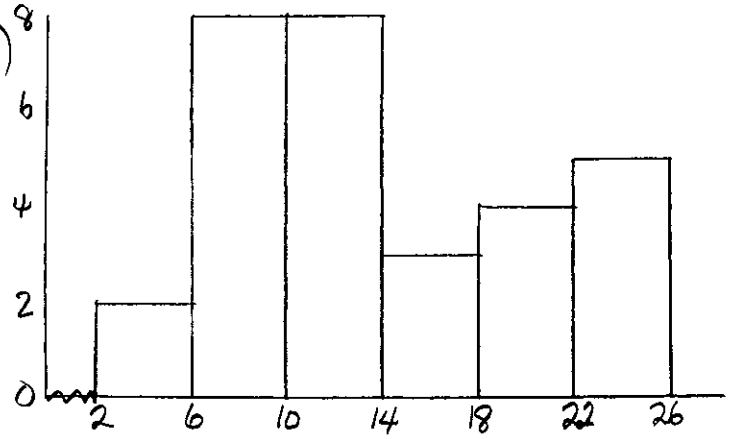
p. 251 # 3, 4, 6, 10

3. a)



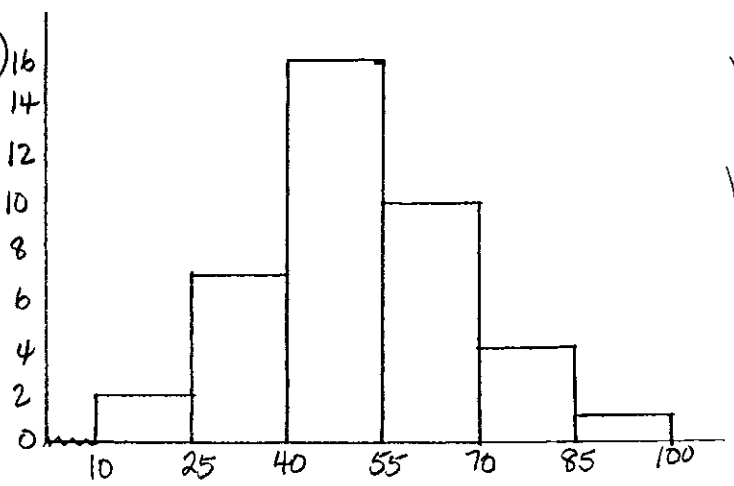
Yes, it is approximately bell-shaped so it it normally distributed.

b)



Not normally distributed because it has two "peaks".

c)



Yes, normally distributed because it is approximately bell-shaped.

p. 251 cont.

4. a) $\text{mean} = \frac{\text{sum of all numbers}}{50} = \frac{5225}{50} = 104.5 \text{ min}$

I am going to do the $(x-\bar{x})^2$ on the calculator and write down the answers

$$\sigma = \sqrt{\frac{182.25+342.25+240.25+992.25+420.25+600.25+702.25+420.25+20.25+2.25+90.25+0.25+3306.25+30.25+110.25+72.25+30.25+2550.25+20.25+30.25+72.25+552.25+240.25+156.25+42.25+210.25+12.25+240.25+930.25+6.25+12.25+12.25+5700.25+20.25+72.25+306.25+306.25+110.25+240.25+272.25+20.25+182.25+420.25+306.25+2450.25+210.25+6.25+30.25+30.25+1560.25}{50}}$$

$$\sigma = \sqrt{\frac{24884.50}{50}} = \sqrt{497.69} = 22.31 \text{ min.}$$

I will not give one that long on the test!

b) mean = 104.5 $\quad\quad$ $\sigma = 22.3$
smallest = 73 $\quad\quad$ largest = 180

Start with 104.5 - then add multiples of 22.3 until you get above 180. Then go back to 104.5 and subtract multiples of 22.3 until you get below 73.

$104.5 - 22.3 = 82.2 \sim 82$
$82.2 - 22.3 = 59.9 \sim 59.5$

$104.5 + 22.3 = 126.8 \sim 127$
$126.8 + 22.3 = 149.1 \sim 149.5$
$149.1 + 22.3 = 171.4 \sim 172$
$171.4 + 22.3 = 193.7 \sim 194.5$

Use the approximate values to create the ranges on your frequency chart

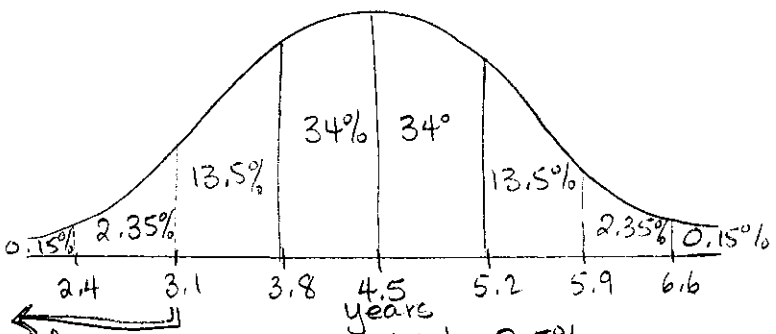
p. 251 cont.

4. b) cont

59.5 - 82.0	|||
82.0 - 104.5	++++ ++++ ++++ ++++ ++++ |||
104.5 - 127.0	++++ ||
127.0 - 149.5	|||
149.5 - 172.0	|||
172.0 - 194.5	|

c) No, there will be a sharp spike at 82 - 104.5 min so it is not bell-shaped

6.

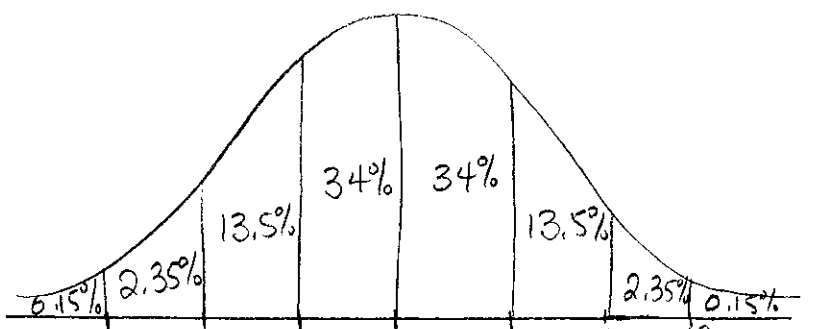


These two spaces add to 2.5%

4.5 + 0.7 = 5.2
5.2 + 0.7 = 5.9
5.9 + 0.7 = 6.6
4.5 - 0.7 = 3.8
3.8 - 0.7 = 3.1
3.1 - 0.7 = 2.4

So the warranty should go for no more than 3.1 yrs to repair no more than 2.5% of the coffee makers.

10.



2.5% are more than 46 years.

130 dolphins

$2.5\%\ (130) = 0.025\ (130) = 3.25$

3 dolphins