(38)

$$\text{median} = 111$$

$$\frac{110 + x}{2} = 111$$

$$110 + x = 222$$

$$x = 112$$

$$\text{range} = 19$$

$$z - 102 = 19$$

$$z = 121$$

$$\text{mean} = 110.5$$

$$\frac{102 + 105 + 110 + \overset{112}{\cancel{x}} + y + \overset{121}{\cancel{z}}}{6} = 110.5$$

$$102 + 105 + 110 + 112 + y + 121 = 663$$

$$550 + y = 663$$

$$y = 113$$

(40) No mention of mound-shaped.
Use Tchebysheff's Rule.

$$52.5 = \mu + k\sigma$$
$$52.5 = 30 + k(5)$$
$$22.5 = k(5)$$
$$4.5 = k$$

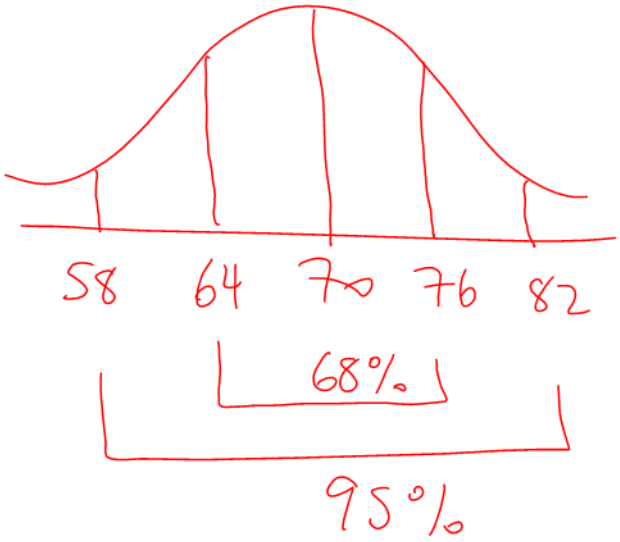
$$1 - \frac{1}{k^2} = 1 - \frac{1}{4.5^2}$$
$$\approx 0.95$$

At least 95%

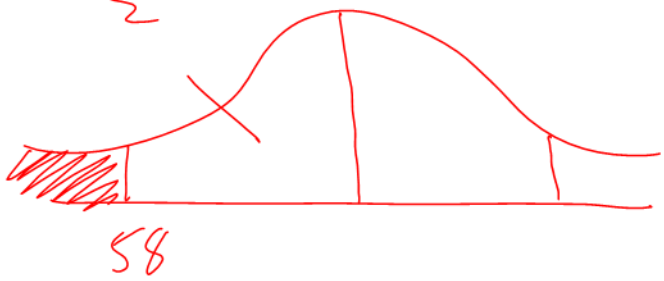
(41) Mound-shaped.
Use Empirical Rule (or Conceptual).

$$58 = \mu + k\sigma$$
$$58 = 70 + k(6)$$
$$-12 = k(6)$$

$-2 = k$



$\frac{0.95}{2} = 0.475$



$0.5 - 0.475 = 0.025$

(Approximately) 2.5%

(46) a) # of symbols = 26 + 26 = 52

$$52 \times 52 \times 52 \times 52$$

$$= 52^4$$

$$= 7,311,616$$

b) # of passwords with no upper-case

$$= 26 \times 26 \times 26 \times 26$$

$$= 26^4$$

# of passwords with at least one upper-case

= total # − # with no upper-case

$$= 52^4 - 26^4$$

$$= 6,854,640$$

(47) a) $\underline{1} \times \underline{1} \times \underline{10} \times \underline{10} = 100$

b) $\underline{10} \times \underline{10} \times \underline{10} \times \underline{1} = 1000$

c) $\underline{1} \times \underline{1} \times \underline{10} \times \underline{1} = 10$

d) $n(A \text{ or } B) = n(A) + n(B) - n(A \text{ and } B)$

$n(21\_\_ \text{ or } \_\_\_7) = n(21\_\_) + n(\_\_\_7) - n(21\_7)$

$= 100 + 1000 - 10$

$= 1090$

(50) a) $n = 40 \quad \bar{x} = 191$

$s = 22 \quad (\sigma \approx s)$

$z = 1.960$

$$\mu = \bar{x} \pm \frac{z\sigma}{\sqrt{n}}$$

$$\mu = 191 \pm \frac{1.960(22)}{\sqrt{40}}$$

$$\mu = 191 \pm 7$$

$$\$184 \leq \mu \leq \$198$$

b) It gets wider.

90% confidence

95%

99%