(38) a) $\bar{x} = \frac{23+9+17+13}{4}$

$= 15.5$

b) $9, 13, 17, 23$

$\text{median} = \frac{13+17}{2}$

$= 15$

c) $\text{median} = 15 + 5$

$= 20$

d) $\text{median} = 2(15)$

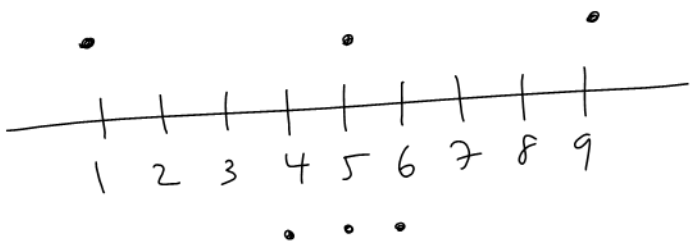
$= 30$

e) the median is still 15
(median does not change).

(39) a) Each measurement was doubled.
Data Set B

b) Each measurement was increased by 2.
The standard deviations are equal.

c)



Data Set A

(40) $1 - \frac{1}{k^2} = 0.9375$

$0.0625 = \frac{1}{k^2}$

$k^2 = \frac{1}{0.0625}$

$k^2 = 16$

$k = 4$

$\mu - k\sigma = 30 - 4(5)$
$= 10$

$\mu + k\sigma = 30 + 4(5)$
$= 50$

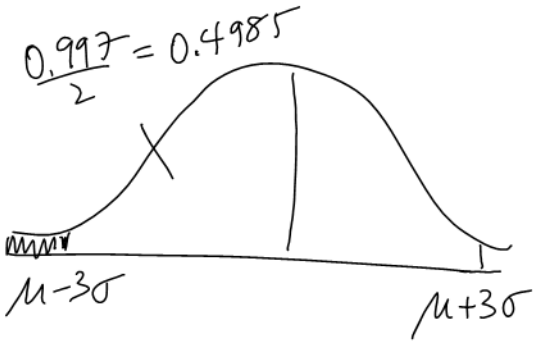
At least 93.75% of measurements fall in the range 10 to 50.

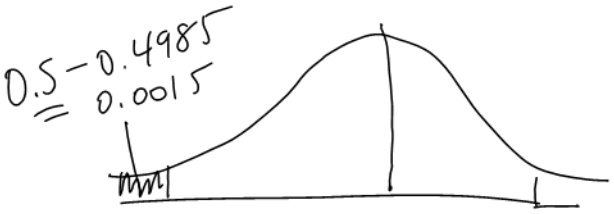
(41) $52 = \mu - k\sigma$

$52 = 70 - k(6)$

$-18 = -k(6)$

$3 = k$





Approximately 0.0015 or 0.15%

(42)

Math

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

$= \frac{80-70}{5}$

$= 2$

Physics

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

$= \frac{78-72}{2}$

$= 3$

The student did better in physics.

(43) a) stratified random sample

b) 1-in-50 systematic random sample

c) simple random sample

d) cluster sample

(44) a) experimental

b) observational

(45) The problem is using mean instead of median. (There could be a few very expensive houses.)

(46) a) $10 + 26 = 36$ symbols

$36^4 = 1,679,616$

b) # with no letters $= 10^4$

with at least one letter

= total # − # with no letters

$= 36^4 - 10^4$

$= 1,669,616$

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

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

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

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

n(start with 8 or end with 13)

= n(start with 8) + n(end with 13)

− n(start with 8 and end with 13)

$= 100 + 10 - 1$

$= 109$

(48) $P(E) = \frac{n(E)}{n_{total}}$

$n_{total} = 312 + 138 + 120 + 80 + 98 + 52$

$= 800$

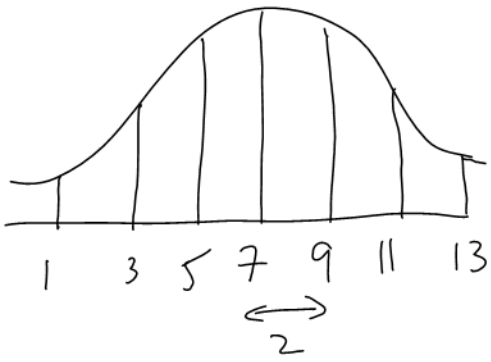
a) $\frac{98 + 52}{800} = 0.1875$

b) $\frac{120 + 80 + 98 + 52}{800} = 0.4375$

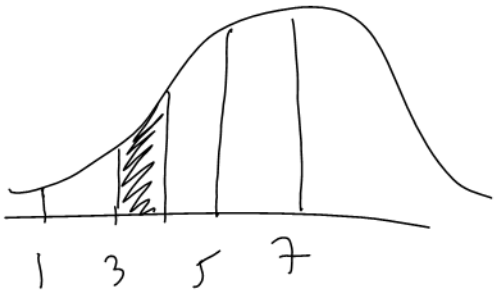
c) $\frac{80}{800} = 0.1$

d) $\frac{120 + 80 + 138 + 52}{800} = 0.4875$

49



a)

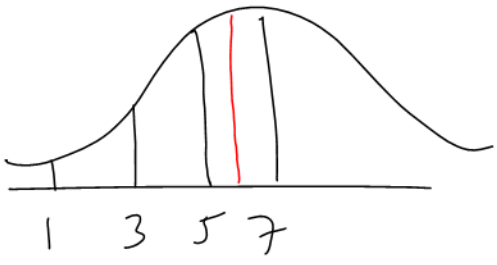


Strictly between 0% and 50%

b)

At least 50%

c)



0%

(50) a) $\mu = \bar{x} \pm z\frac{\sigma}{\sqrt{n}}$

$= 70.2 \pm 1.645\left(\frac{8.1}{\sqrt{100}}\right)$

$= 70.2 \pm 1.3$

90% confidence interval for μ:
$68.9 \leq \mu \leq 71.5$ decibels

b) The confidence interval would get narrower because the term $z\frac{\sigma}{\sqrt{n}}$ would get smaller.