

2 Summarizing Data

$$1. \quad \mu = \frac{49 + 61 + 67 + 68 + 74 + 77 + 79 + 82 + 91}{9} = 72$$

median: the list is ordered
 $n = 9 \Rightarrow \text{odd} \Rightarrow \text{middle value}$

$$\text{median} = 74$$

$$2. \quad \bar{x} = \frac{22 + 25 + 28 + 23 + 22 + 27 + 27 + 29}{8} = \frac{203}{8} \approx 25.4 \quad \checkmark$$

median: order the list $22, 22, 23, 25, 27, 27, 28, 29$
 $n = 8 \Rightarrow \text{even} \Rightarrow \text{average of 2 middle values}$

$$\text{median} = \frac{25 + 27}{2} = 26 \quad \checkmark$$

$$3. \quad \frac{52 + 69 + 73 + x}{4} = 70$$

$$194 + x = 280$$

$$x = 86$$

4. mean = $\frac{\text{sum of test scores}}{\text{\# of students}}$ so sum of test scores = (mean)(\# of students)

$$\text{combined mean} = \frac{78(29) + 72(36)}{29 + 36} = \frac{4854}{65} \approx 74.7$$

$$5. \quad \bar{x} = \frac{36.8(4) + 37.1(6) + 37.2(2) + 37.4(5) + 37.7(8)}{4 + 6 + 2 + 5 + 8}$$

$$= \frac{932.8}{25} \approx 37.31 \text{ } ^\circ\text{C}$$

median: list is ordered
 $n = 25 \Rightarrow \text{odd} \Rightarrow \text{middle value}$

$$\text{middle position} = \frac{25+1}{2} = 13$$

so median = 37.4 $^\circ\text{C}$

$$6. \quad \bar{x} = 600000(0.1) + 800000(0.45) + 1000000(0.3) + 1200000(0.1) + 1400000(0.05)$$

$$= \$910000$$

median: list is ordered
 $0.1 + 0.45 = 0.55 \geq 0.5$
 so the median is \$800000

$$7. \quad \mu = \frac{71 + 76 + 76 + 79 + 83}{5} = 77$$

x	$x - \mu$	$(x - \mu)^2$
71	-6	36
76	-1	1
76	-1	1
79	2	4
83	6	36

$$\sigma^2 = \frac{\sum (x - \mu)^2}{n} = \frac{36 + 1 + 1 + 4 + 36}{5} = 15.6$$

$$\sigma = \sqrt{15.6} \approx 3.9$$

$$8. \quad \bar{x} = \frac{22 + 25 + 27 + 28}{4} = 25.5$$

x	$x - \bar{x}$	$(x - \bar{x})^2$
22	-3.5	12.25
25	-0.5	0.25
27	1.5	2.25
28	2.5	6.25

$$s^2 = \frac{12.25 + 0.25 + 2.25 + 6.25}{4-1} \approx 7 \text{ g}^2$$

$$s = \sqrt{7} = 2.6 \text{ g}$$

9. SD is a measure of spread
We'll calculate σ for each data set using a calculator

a) $\sigma_1 = 4.9$ $\sigma_2 = 4.9$
so they are equally spread out

b) $\sigma_1 = 4.9$ $\sigma_2 = 9.8$
so Set 2 is more spread out

10.

	(a)	(b)	(c)
mean	increase	increase	increase
median	increase	increase	stay the same
SD	stay the same	increase	decrease