③ $\underbrace{0, 3, 8, 17, 18, 22, 24, 26, 28, 28, 30, 34}_{\text{Sum}}$

a) Mean $= \dfrac{238}{12}$

$= 19.8$

Hours	Difference from Mean (19.8)	Square of Difference
0	-19.8	392.04
3	-16.8	282.24
8	-11.8	139.24
17	-2.8	7.84
18	-1.8	3.24
22	2.2	4.84
24	4.2	17.64
26	6.2	38.44
28	8.2	67.24
28	8.2	67.24
30	10.2	104.04
34	14.2	201.64
		$\boxed{1325.68}$

$$s.d = \sqrt{\frac{1325.68}{12}} = \sqrt{110.47} = \boxed{10.51}$$

Samples vs. Populations

SAMPLE

It is usually easier and less expensive to obtain a ***sample*** than to obtain all of the measurements from the ***population***. For this reason, we must learn how to examine the **sample mean** represented by $\bar{x}$ (x bar), and the **sample standard deviation**, represented by S_x .

Formulas:

Sample Mean - $\bar{x} = \frac{x_1 + x_2 + x_3 + x_4 + \dots + x_n}{n}$ {Normal Mean Calculation}

Sample Standard Deviation - $S_x = \sqrt{\frac{(x_1-\bar{x})^2+(x_2-\bar{x})^2+(x_3-\bar{x})^2+\cdots+(x_n-\bar{x})^2}{n-1}}$

*This is the same method as you previously learned for finding standard deviation, with the addition of the "**n – 1**".

POPULATION

We must also learn how to examine the **population mean**, represented by μ (mu), and the **population standard deviation**, represented by **σ** (sigma).

Formulas:

Population Mean – $\mu = \frac{x_1 + x_2 + x_3 + x_4 + \ldots + x_n}{n}$ {Same Formula, just different symbol!}

Population Standard Deviation – $\sigma = \sqrt{\frac{(x_1 - \mu)^2 + (x_2 - \mu)^2 + (x_3 - \mu)^2 + \cdots + (x_n - \mu)^2}{n}}$

These two formulas apply only to ***finite* populations, not ***infinite*** populations.