PHYS 4211

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BEVINGTON

1.4 P. 15 * $\boxed{\text{MEAN} = \bar{x} = 7.36}$

* "MOST PROBABLE" = 8 SINCE IT OCCURS MORE (7 TIMES TOTAL) THAN ANY OTHER x_i.

* **MEDIAN**: SOMEWHAT SUBTLE.

REMEMBER, THAT FOR MODE WE REQUIRE

$$P(x_i < \mu_{1/2}) = P(x_i \geq \mu_{1/2}) = \frac{1}{2}.$$

NOTICE FROM DATA: $P(x_i \geq 8) = 12/25 = 0.48$

$P(x_i \geq 7) = 18/25 = .72$

CLEARLY, YOU COULD ARGUE THAT SINCE $7 < \mu_{1/2} < 8$, WHY NOT TAKE $\mu_{1/2} = 7.5$.

YOU COULD ALSO ARGUE THAT IF YOU REQUIRE $\mu_{1/2}$ = SOME INTEGER, THEN $\mu_{1/2} = 8$.

$\boxed{\text{I ACCEPTED } \mu_{1/2} = \begin{cases} 7.5 \\ 8 \end{cases}}$

$\mu_{1/2} = 7$ IS WRONG.

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1.7 p16

USE A CALCULATOR &
DISTINGUISH BETWEEN σ & S.

SAMPLE VARIANCE $S^2 = \frac{1}{N-1} \sum (x_i - \mu)^2$; $\mu = \frac{\sum x_i}{N}$

IT CAN BE SHOWN THAT

$$S^2 = \frac{N}{N-1} \left(\overline{x^2} - \mu^2 \right); \quad \overline{x^2} = \frac{\sum x_i^2}{N}$$

FROM THE DATA,

$$\mu = \bar{x} = 73.475$$

$$\sum x_i = 2939$$

$$\sum x_i^2 = 225337$$

$$S = 15.52$$

$$\sigma = 15.33$$

$$N = 40$$

YOU HAVE A DATA <u>SAMPLE</u>, SO

$$\boxed{\text{"STANDARD DEVIATION"} = S = 15.52}$$

$$\binom{8}{4} = \frac{8*7*6*5*4*3*2*1}{(4*3*2*1)^2} = 70$$

$$\binom{7}{3} = \frac{7*6*5*4*3*2*1}{(4*3*2*1)(3*2*1)} = 35$$

$$\binom{5}{2} = \frac{5*4*3*2*1}{(3*2*1)(2*1)} = 10$$

\# LOCK COMBO'S

DIGITS CANNOT BE REPEATED

$$\boxed{\text{COMBOS} = 5 \cdot 4 \cdot 3 = 60}$$