BEVINGTON

1.4 D. 15

*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:

\[
P(x_i \geq 8) = \frac{12}{25} = 0.48
\]

\[
P(x_i \geq 7) = \frac{18}{25} = 0.72
\]

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

\[
\mu_{1/2} = 8.
\]

I accepted \( \mu_{1/2} = \{7.5 \ 8\} \)

\( \mu_{1/2} = 7 \) is wrong.
SAMPLE VARIANCE \[ S^2 = \frac{1}{N-1} \sum (x_i - \mu)^2 \], \[ \mu = \frac{\sum x_i}{N} \]

It can be shown that
\[ S^2 = \frac{N}{N-1} (\bar{x}^2 - \mu^2) \]
\[ \bar{x}^2 = \frac{\sum x_i^2}{N} \]

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 sample, so

"Standard Deviation" = \[ S = 15.52 \]
\[
\binom{8}{4} = \frac{8 \times 7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{(4 \times 3 \times 2 \times 1)^2} = 70
\]

\[
\binom{7}{3} = \frac{7 \times 6 \times 5 \times 4 \times 3 \times 2 \times 1}{(4 \times 3 \times 2 \times 1)(3 \times 2 \times 1)} = 35
\]

\[
\binom{5}{2} = \frac{5 \times 4 \times 3 \times 2 \times 1}{(3 \times 2 \times 1)(2 \times 1)} = 10
\]

# Lock Combo's

Digits cannot be repeated

\[
\text{Combos} = 5 \times 4 \times 3 = 60
\]