Warm Up:
If \( x \) is an integer and \( y = -2x - 8 \), what is the least value of \( x \) for which \( y \) is less than 9?

a.) -9   b.) -8   c.) -7   d.) -6   e.) -5

7.3 Sample Means Day 1

Learning Goals: Calculate the mean and standard deviation of the sampling distribution of a sample mean and interpret the standard deviation. If appropriate, use a Normal distribution to calculate probabilities involving sample means.

How tall are we?

How tall are high school seniors in Michigan? Attached are the heights of all 50 high school seniors at a small high school in the upper peninsula.

1.) Make a guess at the mean of all 50 students. Make another guess of the standard deviation of all 50 students.

\[ \mu = 169 \text{ cm} \quad \sigma = 3 \]

2.) Select a random sample of 5 students and calculate the mean height for the sample. Repeat for 4 samples total.

3.) Add your sample means to the dotplot on the board. Sketch it below.
4.) Describe the shape, center and variability of this dotplot.

**Shape**: Roughly symmetric, single peak about 170
**Center**: Approx. median
**Variability**: Smaller than pop. distribution

5.) Compare the 2 dotplots above. How are the dotplots similar? How are they different?

**Shapes**: Similar
**Center**: Similar
**Var.**: Different; smaller \( \rightarrow \) more samples

---

**Coursework:**

pg 454 # 50, 52, 53, 54, 56

---

**Sampling Distribution of \( x \):**

<table>
<thead>
<tr>
<th>Normal:</th>
</tr>
</thead>
<tbody>
<tr>
<td>If a population is approximately Normal, the sampling distribution of ( x ) will also be approximately Normal</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Z-Score:</th>
</tr>
</thead>
<tbody>
<tr>
<td>( z = \frac{x - \mu}{\sigma} )</td>
</tr>
<tr>
<td>( z = \frac{\text{Stat} - \text{Para}}{\text{SD}} )</td>
</tr>
</tbody>
</table>

---

Do the check your understanding with a partner, you have 10 minutes to complete and then we will go over it!!

1.) \( a \) \( n=1 \)

\[
\frac{270.2 \div 0.6}{10} \approx 40.13
\]

2.) \( \mu_x = 210 \) days

3.) \( \sigma_x = \frac{1.6}{\sqrt{10}} = 0.532 \) days

4.) \( \frac{270.2 \div 0.6}{0.532} \approx 270 \)