R-cell. \[ \frac{32 - 29.8}{29.8} = \frac{M_a - \bar{y}}{y} = \frac{2.2}{29.8} = 7.4\% \]

Theory \( M_a \) is 7.4\% more than the \( \bar{y} \).

To see sig - ask expert if 7.4\% is sig.

(b)

**Population**
- all arthropods in this species that are similar to the sample
- calcium levels unknown

**Sample**
- observed arthropods
- calcium levels known: \( \bar{y} = 29.8 \), \( s = 1.8 \)

**Imaginary data**
- all possible \( \bar{y} \)s
- \( n \to \infty \)
- mean \( \bar{y} \)
- \( SE(\bar{y}) = \frac{s}{\sqrt{n}} = 0.5 \)

We know about sample, wondering about population \( \Rightarrow \) stat. inference

(Vice versa is probability)

<table>
<thead>
<tr>
<th>Unknown pop quant</th>
<th>( M = ) pop me</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Sample</strong> estimate ( M )</td>
<td>( \bar{y} = 29.8 )</td>
</tr>
<tr>
<td>give ( t ) as est. ( M )</td>
<td>( SE(\bar{y}) = 0.5 )</td>
</tr>
<tr>
<td>95% CI ( M )</td>
<td>( 29.8 \pm 1.1 )</td>
</tr>
</tbody>
</table>
$t$ curve w/ 12 degrees of freedom $(n-1)$

95% area in middle

$0.05$

$2.179$

$\bar{y} \pm t \frac{s}{\sqrt{n}}$

$= 29.8 \pm 1.1$

$M_0 = 32$ is not in 95% interval $t$ is not supported by the data.

$M - \bar{y}$ is statistical. $32 - 29.8$ is big difference.

This difference is hard to attribute to an unlucky random sample - this means that this difference is probably real.