Section 2.5

PART II

Measures of Relative Position

Women's Heights: $\bar{x} = 161.39$, $s = 7.73$
$n = 30$

→ look at the max. height: $x = 184.1$.

z-score
↳ $z = \dfrac{x - \bar{x}}{s} = \dfrac{184.1 - 161.39}{7.73} = 2.94$

unusual
ie. significant.

$x = 184.1$ cm
↓
2.94 standard deviations above the mean.

→ look at the min height: $x = 148.0$

z-score:

$$z = \frac{x - \bar{x}}{s} = \frac{148.0 - 161.39}{7.73} = -1.73$$

almost 2 std. dev's below the mean
→ moderately significant.

$x = 148.0$ is 1.73 std. dev's below the mean.

Updated Rule for Unusualness/Significance,

Any value, x, is significant (unusual) if it has a z-score where

$$z \gtrsim 2 \quad \text{or} \quad z \lesssim -2.$$

In a bell-shaped distribution, about 5% of values are unusual/significant.

This is based on the Empirical Rule.