Part 5.3 Answers

1. **Margin of Error**: $1.5 \times \frac{1}{2}\left(\frac{1}{\sqrt{n_1}} + \frac{1}{\sqrt{n_2}}\right) = 1.5 \times \frac{1}{2}\left(\frac{1}{\sqrt{1003}} + \frac{1}{\sqrt{1500}}\right) = 0.0430$ (3sf) = 4.30%
   Construct the confidence interval: 6% ± 4.3% = (1.7%, 10.3%)
   Interpret what this Means: We can say, with 95% confidence, the of people who have a favourable opinion about Donal Trump is somewhere between **1.7** percentage points **higher** and **10.3** percentage points **higher** than the percentage of people who have a favourable opinion of Robert Mueller.
   Make a Judgement: This confidence interval **does** support the claim that a higher percentage of people have a favourable opinion of Donald Trump than Robert Mueller because **the confidence interval is entirely positive**.

2. **Margin of Error**: $1.5 \times \frac{1}{2}\left(\frac{1}{\sqrt{n_1}} + \frac{1}{\sqrt{n_2}}\right) = 1.5 \times \frac{1}{2}\left(\frac{1}{\sqrt{548}} + \frac{1}{\sqrt{2746}}\right) = 0.0464$ (3sf) = 4.64%
   Construct the confidence interval: 2% ± 4.64% = (-2.64%, 6.64%)
   Interpret what this Means: We can be fairly sure the percentage of **people in Wellington who have problems with damp houses** is somewhere between **2.64** percentage points **lower** and **6.64** percentage points **higher** than the percentage of **people in Auckland who have more problems with damp houses.**
   Make a Judgement: This confidence interval **doesn't** support the claim that a higher percentage of **people in Wellington have problems with damp houses** than **Auckland** because **zero is contained within the confidence interval**.

3. **Margin of Error**: $1.5 \times \frac{1}{2}\left(\frac{1}{\sqrt{n_1}} + \frac{1}{\sqrt{n_2}}\right) = 1.5 \times \frac{1}{2}\left(\frac{1}{\sqrt{487}} + \frac{1}{\sqrt{576}}\right) = 0.0652$(3sf) = 6.52%
   Construct the confidence interval: 19% ± 6.52% = (12.48%, 25.52%)
   Interpret what this Means: It is a fairly safe bet the percentage of **people from Christchurch who think their city has got better in the last year** is somewhere between **12.48** percentage points **higher** and **25.52** percentage points **higher** than the percentage of **people from Porirua who think their city has got better in the last year.**
   Make a Judgement: This confidence interval **does** support the claim that **A greater percentage of people from Christchurch think their city has got better in the last year** than **those from Porirua** because **the confidence interval is entirely positive**.

4. **Margin of Error**: $1.5 \times \frac{1}{2}\left(\frac{1}{\sqrt{n_1}} + \frac{1}{\sqrt{n_2}}\right) = 1.5 \times \frac{1}{2}\left(\frac{1}{\sqrt{340}} + \frac{1}{\sqrt{330}}\right) = 0.0820$ (3sf) = 8.20%
   Construct the confidence interval: 7% ± 8.20% = (-1.2%, 15.2%)
   Interpret what this Means: It is a fairly safe bet that the percentage of females who travel by car is somewhere between 1.2 percentage points lower and 15.2 percentage points higher than the percentage of males who travel by car."
   Make a Judgement: This confidence interval doesn't support the claim that more females travel to school by car than males films because zero is contained within the confidence interval.