A random sample of 11 statistics students produced the following data, where *x* is the third exam score out of 80, and *y* is the final exam score out of 200.

| Table showing the scores on the final exam based on scores from the third exam. |
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| **x (third exam score)** | **y (final exam score)** |
| 65 | 175 |
| 67 | 133 |
| 71 | 185 |
| 71 | 163 |
| 66 | 126 |
| 75 | 198 |
| 67 | 153 |
| 70 | 163 |
| 71 | 159 |
| 69 | 151 |
| 69 | 159 |

1. Find the least squares line for the given data.
2. Test the null hypothesis $H\_{0}:β\_{1}=0$ against $H\_{a}:β\_{1}\ne 0$. Use $α=0.05$. Interpret the result.
3. Find coefficient of correlation $r$ and interpret its value.
4. Find a 95% confidence interval for the mean final exam scores when the third exam score $x\_{p}=80$.
5. Predict the final exam score for the third exam score $x\_{p}=80$. Use a 90% prediction interval.