AP® Statistics
2002 Sample Student Responses

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(a) Based on the display on page 6, describe how the precision of the estimates of γ has changed over time.

For the first 11 experiments, the precision varied, with no discernible pattern, from a margin of error of .175 to .375. After that, the precision has increased, on aver with later experiments. The last experiment, with a margin of error of ~.25, was the most precise.

(b) Write a few sentences describing the strength of evidence the experiments provide for the claim from Newtonian theory that $\gamma = 0$. Your response must include justification based on the display.

No experiment contains zero within its interval of estimate ± margin of error. In other words, for each experiment, estimate − margin of error is always greater than zero. Therefore, the experiments provide extremely weak evidence for the claim that $\gamma = 0$.

(c) Write a few sentences describing the strength of evidence the experiments provide for the claim from Einstein's theory that $\gamma = 1$. Your response must include justification based on the display.

For 17 of the 21 experiments, the value of one is within its interval of estimate ± margin of error. For some experiments, the estimate is one. The inter for the most precise experiments, in general, center around one. These provide strong evidence to support Einstein's theory.

(a) Based on the display on page 6, describe how the precision of the estimates of γ has changed over time.

The margin of error has gotten smaller over time and the estimate of γ have gotten to where they all fall at 1 or very close to it. Based on this, we can conclude that over time the precision of the estimates has improved.

(b) Write a few sentences describing the strength of evidence the experiments provide for the claim from Newtonian theory that $\gamma = 0$. Your response must include justification based on the display.

These experiments provide no evidence for the claim from Newtonian theory that $\gamma = 0$. None of the estimates, even including their margin of error, come close to including 0 as an estimate of γ.

(c) Write a few sentences describing the strength of evidence the experiments provide for the claim from Einstein's theory that $\gamma = 1$. Your response must include justification based on the display.

These experiments provide strong evidence for the claim from Einstein's theory that $\gamma = 1$. All but 4 of the 21 experim include 1 in their margin of error, and particularly as time goes on, the majority of the estimates fall either right at 1 or very close to it. The estimates seem to be centered around 1 as the value of γ.