SOLUTIONS

COMMENTARY

2.(b) Student is identified as needing improvement, even though his true mean quiz score is acceptable (40% or higher).

(c) Student is not identified as needing improvement, even though his true mean quiz score is unacceptable (below 40%).

(d) Mr. Finkel, if he is like most teachers, would rather make a Type I error (i.e., raising unnecessary notes of alarm) than a Type II error (i.e., failing to identify a student who needs improvement). Most parents would tend to agree; they would rather be "over-concerned" with their children's progress than "under-concerned." Most students, however, would prefer a Type II error to a Type I error, since a warning comment might have consequences (e.g., grounding or loss of allowance) that they would prefer not to face, even if that means going until late in the grading period with a false sense of security. Summary:

Type II	is of greater concern to Mr. Finkel
Type I	" " " " students
Type II	" " " " parents

Answers may vary. Quality of the reasoning is what counts here.

3.(a) $m.o.e. = (z^*)(s.e.)$

$= 1.96\sqrt{\frac{pq}{n}} \leq 1.96\sqrt{\frac{(.5)(.5)}{n}}$ (using worst-case value for s.e. here)

$= \frac{0.98}{\sqrt{n}} \overset{\text{want}}{<} .05$

$\frac{\sqrt{n}}{0.98} > 20$ Taking reciprocal of both sides flips direction of inequality! You learned that in Algebra II.

$\sqrt{n} > 20(0.98) = 19.6$

$n > 384.16 \Rightarrow$ At least (385) students must be polled. Always round up in problems like this.