| Math | 153 - | Quiz | 9 |
|----------|-------|------|---|
| April 23 | 2015 | | |

| Name _ | key | | |
|--------|-----|-------|--|
| | J | Score | |

Show all work to receive full credit. Supply explanations when necessary.

- 1. (6 points) A manufacturer of pain reliever tablets claims that the tablets have a mean weight of 250 mg with a standard deviation of 4 mg. You select a random sample of 35 tablets.
 - (a) What is the probability the mean weight of the sample is less than 248 mg?

(b) If your sample actually had a mean weight of 247.6 mg, what conclusion would you draw?

THIS IS EXTREMELY UNLIKELY. | WOULD DOUBT

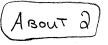
(c) What is an unusually small mean weight?

$$a50 - a\left(\frac{4}{\sqrt{35}}\right) \approx a48.65 \text{ mg}$$

(d) Explain why the Central Limit Theorem applies in this problem.

$$N = 35 > 30$$

- 2. (4 points) While calibrating a speed radar gun, a police officer has determined that at speeds near 70 mph, the errors in detected speeds are approximately normally distributed with mean 2.42 mph and standard deviation 0.36 mph. After working a speed trap along the expressway for several days, the police officer chooses a random sample of 10 speeds that were recorded with the radar gun.
 - (a) About how many of those speeds would be in error by more than 2.75 mph?



(b) What is the probability that the mean error in those speeds is greater than $2.75 \,\mathrm{mph?}$

(c) Explain why the Central Limit Theorem applies in this problem.

ERRORS ARE NORMALLY DISTRIBUTED