

2007602

(a) $X = \# \text{ of pets}$

$$\begin{aligned}
 P(X > 3) &= P(X=4) + P(X=5) + P(X=6) + P(X=7) \\
 &= .07 + .04 + .04 + .02 \\
 &= \boxed{.17}
 \end{aligned}$$

(b) each household is a "trial"

- $P(\text{violation}) = .17$ (from part a)
- assume each household chance of violation is indep.
- finding number out of 10

This is a binomial scenario with $n=10$
 $p=.17$

let $Y = \# \text{ households in violation out of 10}$

Y	0	1	2	3	4	5	6	7	8	9	10
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$$P(Y=2) = \text{binompdf}\left(\begin{matrix} 10 \\ n \end{matrix}, \begin{matrix} .17 \\ p \end{matrix}, \begin{matrix} 2 \\ x \end{matrix}\right) = \boxed{.2929}$$

$$P(Y=2) = {}_{10}C_2 (.17)^2 (1-.17)^8 = 45 (.17)^2 (.83)^8 = \boxed{.2929}$$

(c) we are given the population parameters $\mu = 1.65$
 $\sigma = 1.851$

Sampling distribution of sample means for a sample of $n = 150$ would have:

$$\mu_{\bar{X}} = \mu = 1.65$$

$$\sigma_{\bar{X}} = \frac{\sigma}{\sqrt{n}} = \frac{1.851}{\sqrt{150}} = .1511$$

with $n=150$ (larger than 30) the Central Limit Theorem says the shape of the sampling distribution will be

approximately normal

with $\mu_{\bar{X}} = 1.65$ pets

$\sigma_{\bar{X}} = .1511$ pets