Question 3

Monday, September 17, 2018 10:23 AM

H_0: The mean human body temperature μ is 98.6°F

$\alpha = 0.01$

H_a: $\mu \neq 98.6°F$

$\bar{X}$: sample mean body temp

$\bar{X} = 98.25\ °F$

S_x: sample standard deviation

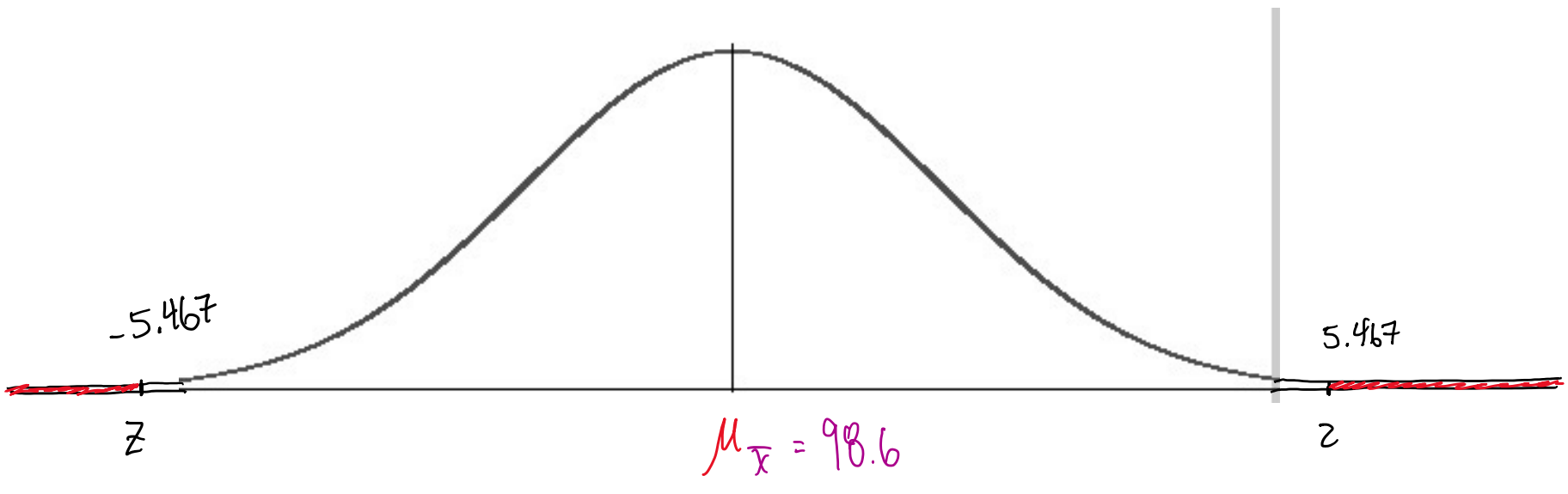
$S_x = 0.73°F$

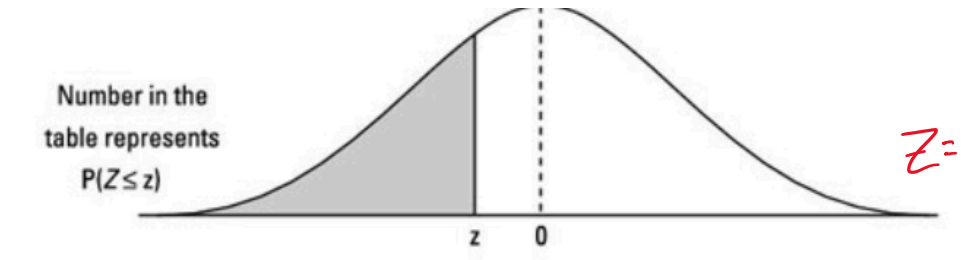
$n = 130$

$$Z = \frac{\bar{X} - \mu}{\frac{S_x}{\sqrt{n}}}$$

$$Z = \frac{98.25 - 98.6}{\frac{0.73}{\sqrt{130}}} = \frac{-0.35\ °F}{0.064} \approx -5.467$$

p-value < 0.0002





$Z = -5.46$

$<$

z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
−3.6	.0002	.0002	.0001	.0001	.0001	.0001	.0001	.0001	.0001	.0001
−3.5	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002	.0002
−3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
−3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
−3.2	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005
−3.1	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007

$Z = -3.6$

p-value = 0.0001

p-value $\quad \alpha$

$0.0002 < 0.01$

∴ We reject H_0 and we are confident that the mean human body temperature is not 98.6°F