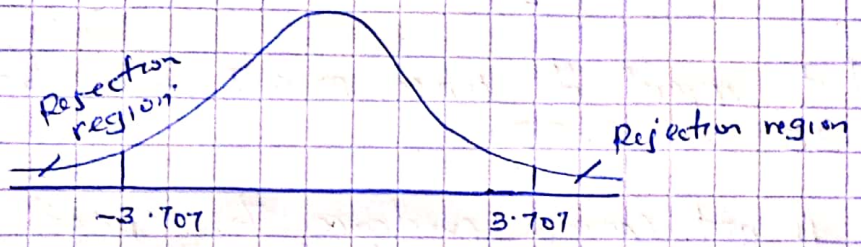
1. (a) $H_0: \mu = 500$ (claim)
$H_1: \mu \neq 500$

(b) Critical values = ~~-2.58 and 2.58~~
= -3.707 and 3.707



(c) $\bar{x} = 461.857$
$s = 176.78$
$n = 7$

$$t = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}} = \frac{461.857 - 500}{\frac{176.78}{\sqrt{7}}}$$

$$= -0.571$$

(d) Fail to reject H_0 since the test statistic falls between -3.707 and 3.707.

(e) There is not enough evidence to reject the claim that the average of the number of rooms in hotels in a large city is 500

2 (a) $H_0: \mu = 500$
$H_1: \mu > 500$ (claim)

(b) Critical value = 1.796

(c) $\bar{x} = 527$
$s = 23$
$n = 12$

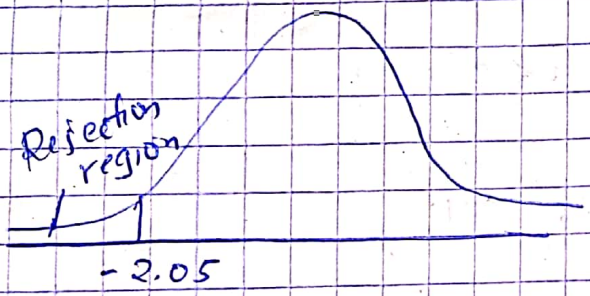
$$t = \frac{\bar{x} - \mu}{\frac{s}{\sqrt{n}}} = \frac{524 - 500}{\frac{23}{\sqrt{12}}} = 3.615$$

(d) Reject H_0 since the test statistic falls in the rejection region

(e) There is enough evidence to support the claim that the mean of distance required for take off is more than 500m

3. (a) $H_0: \mu = 7.5$
$H_1: \mu < 7.5$ (claim)

(b) Critical value = -2.05



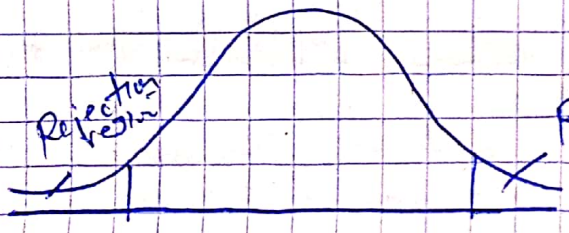
(c) $$z = \frac{\bar{x} - \mu}{\frac{\sigma}{\sqrt{n}}} = \frac{7.01 - 7.5}{\frac{3.7}{\sqrt{100}}} = -1.324$$

(d) Fail to reject H_0 since -1.324 is greater than -2.05

(e) There is not enough evidence to support the claim that the mean for all car owners is less than 7.5 years

(4) (a) $H_0: p = 0.35$ (claim)
$H_1: p \neq 0.35$

(b) Critical values = -2.33 and 2.33



(c) $\hat{p} = \frac{x}{n} = \frac{19}{48} = 0.396$

$$z = \frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{n}}} = \frac{0.396 - 0.35}{\sqrt{\frac{0.35(1-0.35)}{48}}}$$

$$= 0.67$$

(d) Fail to reject H_0 since 0.67 falls between -2.33 and 2.33

(e) There is not enough evidence to reject the claim that 35% of people said that they drink a caffeinated beverage to combat midday drowsiness

5. (a) $H_0 : p = 0.784$
$H_1 : p > 0.784$ (claim)

(b) Critical value = 1.64

(c) $\hat{p} = \frac{x}{n} = \frac{630}{750} = 0.84$

$$z = \frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{n}}} = \frac{0.84 - 0.784}{\sqrt{\frac{0.784(1-0.784)}{750}}}$$

$$= 3.73$$

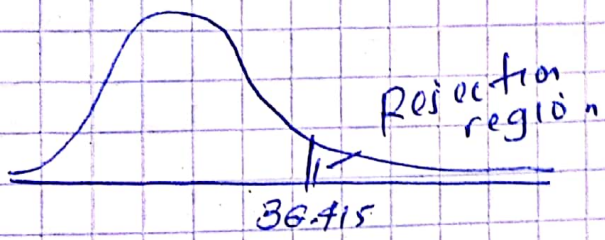
(d) p-value = 0

(e) Reject H_0 since the p-value is less than 0.05.

(f) There is enough evidence to support the claim that its on-time arrival rate is now higher than 78.4%

6 (a) $H_0: \sigma = 6$
$H_1: \sigma > 6$ (Claim)

(b) $\chi^2 = 36.415$



(c) $$t = \sqrt{\frac{(n-1)s^2}{\sigma^2}} = \sqrt{\frac{(25-1)\times 81}{36}} = 7.348$$

(d) Fail to reject H_0 since 7.348 is less than 36.415

(e) There is not enough evidence to support the claim that the standard deviation for the number of pages in a romance novel is greater than 6