1.

$X \sim B(n, p)$

N is large and p is close to 0.5(i:e 0.44)

By Binomial Approximation,

$X \sim N(np, np(1-p))$; $(n = 50, p = 0.44)$

$X \sim N(44, 24.64)$

Mu = 44 and sigma = 4.96

$P(Z >= 1.209) = 1 - P(Z < 1.209)$

$= 0.1132$

2.

A)

After Calculating,

Test statistic = -3.16

Two tailed, so alpha = 0.025

Df = 29;

T(alpha/2) = 2.045; (which is our critical value)

Test statistic (-3.16) does not lie between (-2.045 to 2.045);

So, we can reject null hypothesis.

There is a significant diff between means of weekly exercises.

B)

Find Sp;

Sp is the pooled estimate of common SD for both large and small datasets.

Sp = 0.122; (always lies between s(cs) and s(bio))

Df = 58

Alpha = 0.05

T(alpha/2) = 1.96

After calculating,

CI at 95perc interval = -0.1 ± (0.06)

Margin of error = 0.06

C)

This means that we are 95% confident that the difference in mean weekly hours of exercise between cs and bio students is between -0.16 and -0.04

Because of the small sample size, a very imprecise estimate of difference in mean is produced.

3.

A)

No, always should include confidence Intervals along with p_value to understand significance much better.

Overall Significance = 1 – (1 - alpha) ^m

= 0.401