MATH/STAT 1300
Sample Final Solutions

1. Mean is 2328, median is 274. Large difference is due to the sales of "To The Extreme". The outlier affects the mean more than the median.

2a. Distribution is bump shaped and symmetric, though has a bit of bimodality with a larger number of low speeds.
2b. Speeds are likely reported in round numbers (55, 60, 65)

3a. $P(\text{attached}) = .33$ b. $P(\text{no attached}) = .135$ c.* $P(<2 \text{ attached}) = .468$

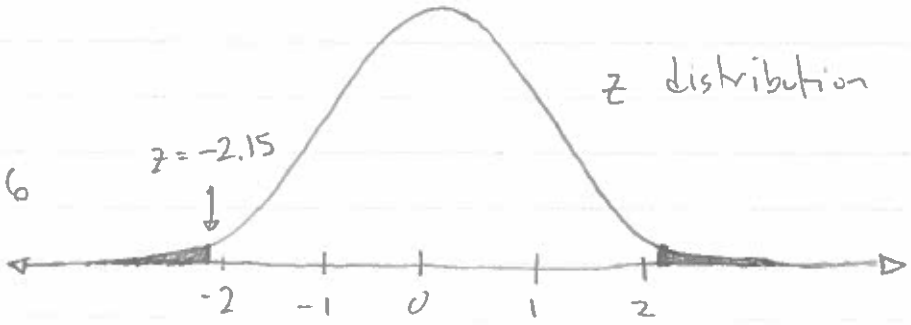
4a. Obs study. χ^2 test for goodness of fit.*
b. Obs study. Matched pairs t-test
c. Experiment. Two indep. samples t-test

* We didn't do these sorts of questions this year

5 a. F b. F (totally absurd!) c. F d. F e. T

6. 3.27%

7. P = .0316



8.

40	7
41	
42	
43	
44	
45	
46	
47	
48	8
49	
50	
51	0
52	9697
53	44069
54	2746
55	07358
56	1235
57	95
58	65
59	

9. μ ; true mean of Cavendish's method.

$H_0: \mu = 5.5$

$H_a: \mu \neq 5.5$

$t = -1.267$ with 28 DF.

Cavendish's method gave a value not significantly different from the modern accepted value ($P = 0.216$)

10. a. Negative. Higher lithium levels correspond to lower suicide rates
b. Significant for men. Not for women.

11. μ_Y, μ_E : True mean FB balance for young and elderly.

$H_0: \mu_Y = \mu_E \quad H_a: \mu_Y \neq \mu_E$

$t = 2.3035$. There is a significant difference in FB balance between young and elderly ($P = 0.04183$)

12. μ_{FB}, μ_{SS} : True mean FB and SS balance

$H_0: \mu_{FB} = \mu_{SS} \quad H_a: \mu_{FB} \neq \mu_{SS}$

$t = 2.2494$ with 16 DF.
There is a significant difference between FB and SS balance ($P = .03892$)

13. $[14.329, 30.115]$

14a. $\widehat{cases} = -53.76 + 32.90(day)$
b. Predict 571.3 cases for day 19
c. $R^2 = .875$, so 87.5 percent of variation in cases is explained by day. However, looking at the scatterplot with regression line, the data appears to be non linear.

15a. $\widehat{logcases} = 2.4645 + 0.3382(day)$
b. Predict logcases to be 8.89 on day 19
c. Predicts 7258 cases on day 19