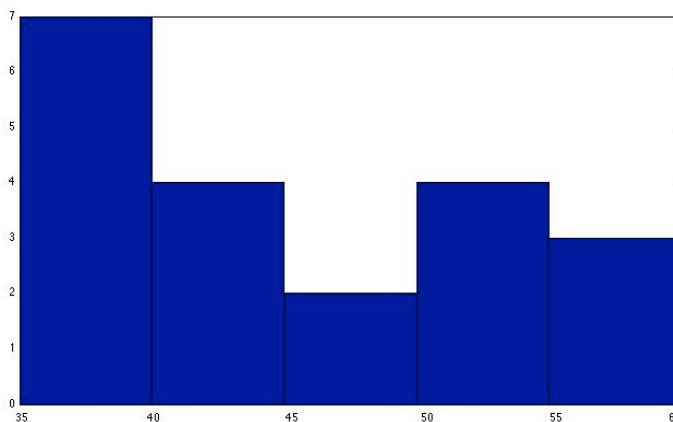


**Math 151 – Sample Exam 1 Answers– Fall 2015 – Louis Gross**

1. (a) Positively correlated,  $R^2$  in the range .5-1 (exact  $R^2$  is .83)  
 (b) using the points (100, 10) and (130, 50),  $y = (4/3)x - 123$   
 (c) change is  $(4/3)*150 - 123 = 77$  cm so height = 227 cm  
 (d) below height of about 92 cm , which makes no sense since individual females are expected to continue growing in height when they are at this height (about 3 ft. tall).
  
2. mean = 4, median = 4 range = 7, variance = 6, standard deviation =  $\sqrt{6} = 2.4$
  
3. (a)  $y = 25$ , (b)  $y = -(\ln 5)/2 = -.805$ , (c)  $x = \sqrt{(e^3 - 4)} = 4.0$ .
  
4. The first line of Matlab code produces a histogram with five bars for leaf length.  
 The second line produces a scatter plot with leaf length on the horizontal axis and leaf width on the vertical axis and a point for each leaf shown with a “+” sign.  
 The third line finds the linear regression between leaf length (on the horizontal axis) and leaf width (on the vertical axis) with c(1) giving the slope of the regression line and c(2) giving the y-intercept.
  
5. (a)  $N(t) = 200 (\sqrt{2.5})^t = 200 (1.58)^t$  or  $N(t) = 200 e^{.48t}$   
 (b) at  $t = 4.8$  years
  
6. (a)  $M_L = 10^{-2/3} M_R^{2/3}$  or  $M_L = .215 M_R^{2/3}$   
 (b)  $M_L$  for species A is 1.58 times the  $M_L$  for species B so it is less than twice
  
7. (a)



- (b) midrange is 47 and arithmetic mean is smaller than midrange
- (c)  $7/20$
  
8. (a)  $D(0) = 20$  mg/ml

(b)  $D(t) = 20 e^{-.29 t}$  or  $D(t) = 20 (.1)^{t/8}$  or  $D(t) = 20 10^{-t/8}$

(c)  $t = 10.4$  hr

9. (a) (4,4) and (10,8)

(b)  $\ln(\text{DEE}) = 2/3 \ln(M) + 4/3$

(c)  $\text{DEE} = e^{4/3} M^{2/3} = 1.98 M^{2/3}$