

HW2 due Friday, Sept. 6. Do problems sequentially, do not put problems side by side. Use a stapler. Box relevant answer. **Two pages: problems A)-H)**

Math 282 Quiz 1 is on Friday, Aug. 30 and covers bar graphs, histograms, stem plots, box plots and \bar{x} . Quiz 2 is on Friday, Sept. 6 and covers the same material as quiz 1 plus the median and the SD s and using the Z table. You may have one sheet of notes for each quiz. Tables will be provided.

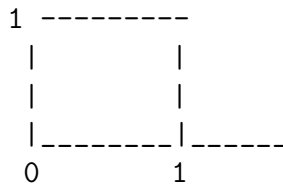
problems

A) Levels of blood phosphate are shown below.
5.6 5.2 4.6 4.9 5.7 6.4

- a) Find the mean.
- b) Find the variance and the standard deviation.

comment See ex. 2.7 on p. 49-50 for the work needed. In b) do not forget to give both the sample standard deviation and the sample variance. Also see ex. 2.1 on p. 40. Include a table. Answers should be near 5, 0.6 and 0.4 but use more decimals.

B) The density curve shown takes on the value 1 on the interval (0,1).



- a) What percent of observations lie above 0.8?
- b) What percent of observations lie below 0.6?
- c) What percent of observations lie between 0.25 and 0.75?

hint area of box = (base)(height). Similar to problem 3.2.

C) The "adhesion" of a train follows a normal distribution with mean 0.37 and standard deviation SD 0.04.

- a) What proportion of adhesions are higher than 0.40?
- b) What proportion of adhesions are between 0.40 and 0.50?
- c) Suppose an improved train has adhesion that follows a normal distribution with mean 0.41 and SD 0.02.
 - i) What proportion of adhesions are higher than 0.40?
 - ii) What proportion of adhesions are between 0.40 and 0.50?

comment See ex. 3.7 and ex. 3.8, p. 79-80. Answers near 0.2 and 0.7. Recall that the area to the left of values greater than 3.5 is approximately 1.0 for the standard normal curve. Making a picture for X and Z should help.

D) IQ scores are approximately normally distributed with mean 100 and standard deviation 15.

- a) What IQ scores fall in the lowest 25% of the distribution?
- b) How high an IQ score is needed to be in the highest 5%?

comment backwards: For b) see ex. 3.10 and ex. 3.11 on p. 84-85.
Draw the Z curve 1st, find z^* , then solve for x^* . Answers near 90 and 125.

E) 3.44 The heights of women aged 20 to 29 are approximately $N(64, 2.7)$. Men of the same age have heights approximately $N(69.3, 2.8)$. What percent of young women are taller than the mean height of young men?

comment See comment for C). Want $P(X > 69.3)$ which is near 0.02.

F) Deciles are points that mark off the lowest 10% and highest 10%. On a density curve, these are the points with areas 0.1 and 0.9 to the left under the curve. What are the deciles of the $N(64, 2.7)$ distribution?

comment See comment for D).

G) from 4.28 The table below lists the percentage of adult birds in a colony that return from the previous year and the number of new adults that join the colony. Data is for 13 sparrowhawk colonies.

%returning	74	66	81	52	73	62	52	45	62	46	60	46	38
new adults	5	6	8	11	12	15	16	17	18	18	19	20	20

- a) plot the new birds (response) against the percent returning (explanatory).
- b) Describe the form, direction and strength of the relationship between the percentage of returning adults and the number of new birds.

comment for G) and H): See ex. 4.3 on p. 97-98 and ex. 4.5 on p. 101-102.

H) 4.8abc How does fuel consumption of a car change as its speed increases?

speed(km/h)	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150
fuel used	21	13	10	8	7	5.9	6.3	6.95	7.57	8.27	9.03	9.87	10.79	11.77	12.83

- a) Make a scatterplot. (What is the explanatory variable?)
- b) Describe the form of the relationship. It is not linear. Explain why the form of the relationship makes sense.
- c) It does not make sense to describe the variables as either positively or negatively associated. Why?