Online

Math 282 Spring 2011 Exam 1 Name_____
15 problems, 10 points each As always SHOW WORK.

Use the following information for problems 1) and 2). The time in seconds for five rats to complete a maze were 24, 37, 38, 43, and 33.

1) Find the sample mean and median of these numbers.

24 33 37 38 43
↑
M

or -2

$\frac{\Sigma x}{n} = \frac{175}{5} = \boxed{\bar{x} = 35,\ M = 37}$

2) Find the standard deviation s of these numbers.

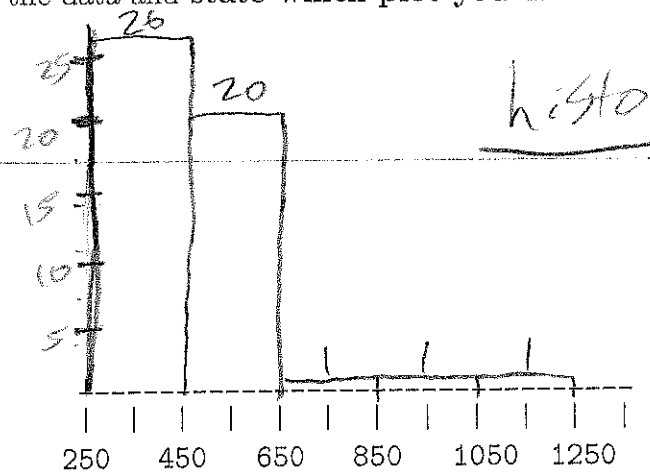
x	$x-\bar{x}$	$(x-\bar{x})^2$
24	-11	121
33	-2	4
37	2	4
38	3	9
43	8	64

$202 = \Sigma (x-\bar{x})^2$

$s = \sqrt{\frac{\Sigma (x-\bar{x})^2}{n-1}} = \sqrt{\frac{202}{4}} = \sqrt{50.5} = \boxed{7.1063}$

e 3) Data for federal aid per capita for the 50 states in 1986 is summarized below. Make a histogram or bar graph of the data and **state which plot you used.**

class	count
250 <= < 450	26
450 <= < 650	20
650 <= < 850	1
850 <= < 1050	1
1050 <= < 1250	1



3
histogram

Math 282 Spring 2011 Exam 1

Use the following information for problems 4), 5) and 6). Suppose that white tailed deer are caught, tagged and fitted with a small radio transmitter. Several months later, the deer are tracked and the distance X from the release point is recorded. The distances were approximately normal with a mean of 3200 feet and a standard deviation of 960 feet.

4) What distance X must a randomly selected deer travel from the release point in order for the distance to be in the top 10%?

.9 .1 | 1.2 | .08 .09 | .9007 .9015 | $z^* = 1.28$

$x^* = \mu + \sigma z^* = 3200 + 960(1.28) =$ **4428**

1.29 .4384 −3 −1.28 −5

5) Find the probability that X will be greater than 4000.

3200 4000 | $\frac{4000-3200}{960} = 0.83$ | 0.8 | .03 | .7967

.83 | $P(X > 4000) = 1 - .7967 =$ **0.2033**

1.5

6) Find the probability that X will be between 2100 and 5200.

2100 5200 3200 | $z = \frac{2100-3200}{960} = -1.15$ | $z = \frac{5200-3200}{960} = 2.08$

−1.1 | .05 .08 | .1251 | 2.0 | .9812 | Prob = .9812 − .1251 = **0.8561**

e 7) Suppose that the scores on 10 makeup history finals are listed below.

122 101 145 113 116 127 139 118 134 136

Make a stem plot for the data. Do not forget to include the stem and leaf units.

10	1
11	3 6 8
12	2 7
13	4 6 9
14	5

Stem: tens
Leaf: ones

Math 282 Spring 2011 Exam 1

Use the following information for 8) and 9). The table below will be used to find the correlation r between x and y. Note that $\overline{x} = 58.2$, $s_x = 13.198$, $\overline{y} = 66.0$, and $s_y = 15.890$.

x	y	$z_x = (x - \bar{x})/s_x$	$z_y = (y - \bar{y})/s_y$	$z_x z_y$
38	41	−1.5305	−1.5733	2.4080
56	63	−0.1667	−0.1888	0.0315
59	70	.0606	0.2517	.01525
64	72	0.4395	0.3776	0.1659
74	84	1.1972	1.1328	1.3561

8) Fill in the table, show work. 3.97675

$z_x = \frac{59 - 58.2}{13.198} = .0606$, $z_y = \frac{70 - 66}{15.89} = 0.2517$

$z_x z_y = (.0606)(.2517) = .01525$

9) After completing 8), use the above table to find the correlation r between x and y.

$r = \frac{\sum z_x z_y}{n-1} = \frac{3.97675}{4} = .9942 = \frac{3.9768}{4}$

Use the following information for problems 10) and 11). It is desired to predict *calories* (consumed per day) from a person's *weight* (in kilograms). The least squares equation is $\hat{y} = 112.16 + 26.90x$.

10) What is the response variable?

Calories

or -9

11) Predict the calories if weight = 50.

$\hat{y} = 112.16 + 26.9(50) = 1457.16$

Math 282 Spring 2011 Exam 1

9 16 23 25 17 12 13 15 18 18

Use the following information for problems 12) and 13). The numbers above are number of people bitten by alligators in Florida for years 1998 to 2007.

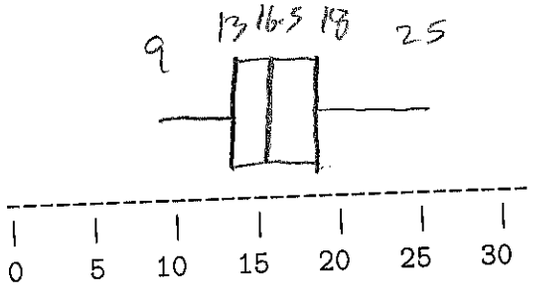
12) Give the 5 number summary: min, Q1, median, Q3, and max. SHOW WORK.

9 12 13 15 16 | 17 18 18 23 25

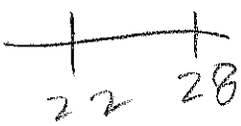
↑ Q1 ; med = 16.5 ; ↑ Q3

min	Q1	m	Q3	max
9	13	16.5	18	25

13) Draw a box plot for the alligator bite data.



14) Suppose the ACT score X is approximately normal with mean $\mu = 22$ and standard deviation $\sigma = 3$ points. Find the probability that a randomly selected ~~midterm~~ ACT score is less than 28.



$$z = \frac{28-22}{3} = 2.00$$

2.00 → .9772

$$P(x < 28) = .9772$$

1 − .9772 = .0228, −5

15) Suppose that $\sum(x_i - \bar{x})^2 = 6016$ and $n = 60$. Find the standard deviation s.

$$s = \sqrt{\frac{\sum(x_i - \bar{x})^2}{n-1}} = \sqrt{\frac{6016}{59}} = \sqrt{101.966} = 10.0978$$