

MATH 1681.100 FIRST EXAM

Print Name:

STEPHEN MUIR

Sign Name:

10 points

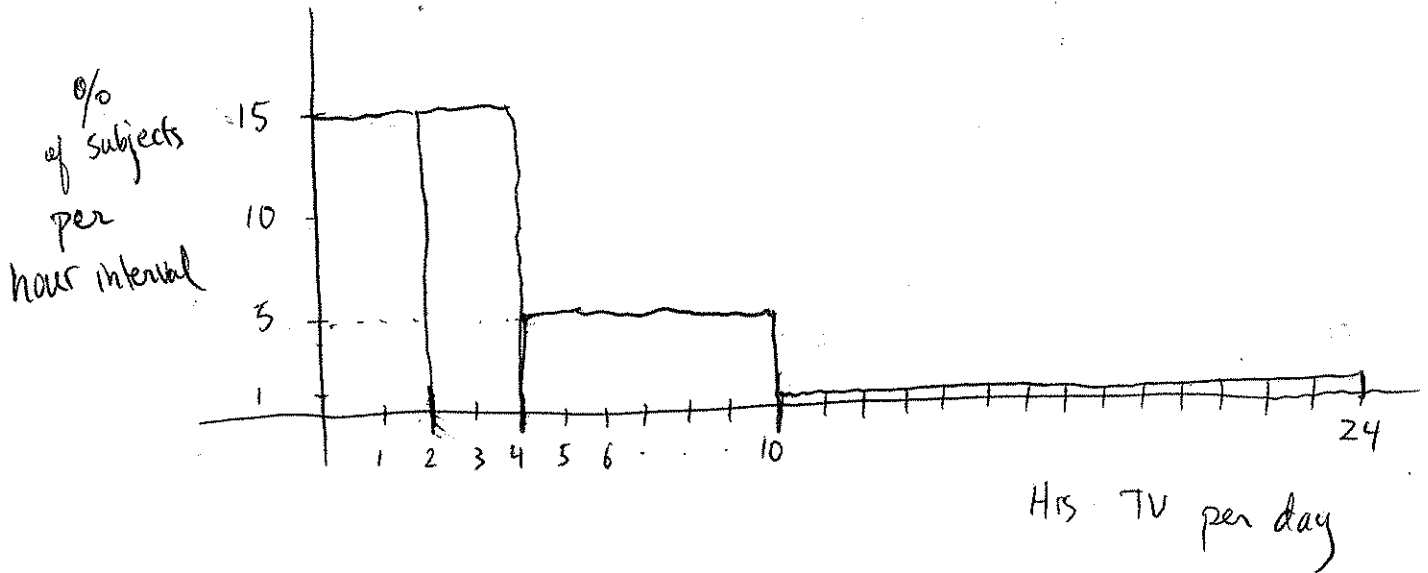
(4) You asked 10 people how many hours of TV they watch per day. Here are the results:

- | | | | |
|----------|-----------------------|-----------|----------------------|
| Person 1 | 2 hours | Person 6 | 4 hours |
| Person 2 | $3\frac{1}{2}$ hours | Person 7 | $1\frac{1}{2}$ hours |
| Person 3 | 6 hours | Person 8 | 5 hours |
| Person 4 | 0 hours | Person 9 | 1 hour |
| Person 5 | $10\frac{1}{2}$ hours | Person 10 | 3 hours. |

Now fill in the percentage column of the following distribution table and sketch a histogram to display the distribution.

	Hrs TV per day	Percentage of Subjects	Height of Histo.
Persons 4, 7, 9 →	(0, 2)	30%	15
Persons 1, 2, 10 →	(2, 4)	30%	15
Persons 6, 3, 8 →	(4, 10)	30%	5
Person 5 →	(10, 24]	10%	$\frac{10}{14}$

(percentage divided by interval length)



5 points each;

Must have done

3 of these 4 problems

- (5) Systematic error in repeated measurements tends to throw off the average [standard deviation]. (Circle one.)

(stretched measuring tape)

- (6) When making repeated measurements of the same object with the same instrument under the same conditions, the standard deviation tells you how much chance error [systematic error] is involved in the measurement process. (Circle one.)

fluctuation around average = "spread" of distribution

- (7) The *median* is another name for the 50th percentile.


- (8) The *standard normal distribution* is another name for the normal distribution with average 0 and standard deviation 1.

10 points

- (9) For a variable following a normal distribution, what percent of subjects will be found to have values within


- (a) one standard deviation of the average?

≈ 68%

Exact 
 Answer: $84.13 - 15.87 = 68.26\%$

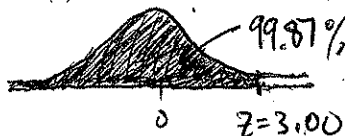
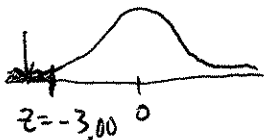
- (b) two standard deviations of the average?

≈ 95%

Exact 
 Answer: $97.72 - 2.28 = 95.44\%$

- (c) three standard deviations of the average?

0.13%



In between, $99.87 - 0.13 =$

$= 99.74\%$

(Hint: You may remember the first two as common "rules of thumb". You will likely have to use your standard normal distribution table for the last one.)

10 points

$$\left(\text{Use } z = \frac{x - A}{SD} \right)$$

(10) Pocatello Joe grows potatoes whose weights follow a normal distribution with average 1.1 lbs and standard deviation 0.2 lbs.

(a) What percentage of his potatoes weigh more than 1 lb?

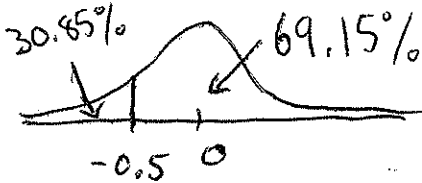
1 lb, assume 1.0 lbs is $z = \frac{1.0 - 1.1}{0.2} = -\frac{1}{2} = -0.5$

From table,

for $z = -0.50$,

30.85% of potatoes less than 1.0 lbs

so



69.15% of potatoes more than 1.0 lbs

10 points

(b) Joe can be sure that 99% of his potatoes weigh more than ___ lbs.
(Find the heaviest weight for which this can be said.)

$$\left(\text{Use } X = A + (z)(SD) \right)$$

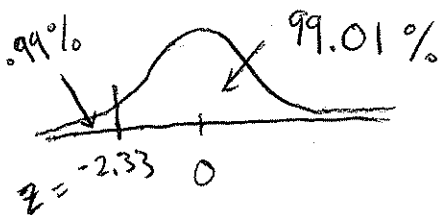
Work backwards:

find the z (largest z)

with 99% above it, (meaning 99.00%)

so 1% or less below it;

From table, for $z = -2.33$



Finally, $z = -2.33$ corresponds to the weight

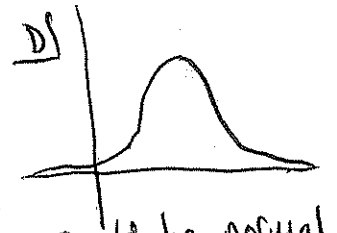
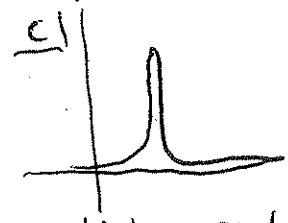
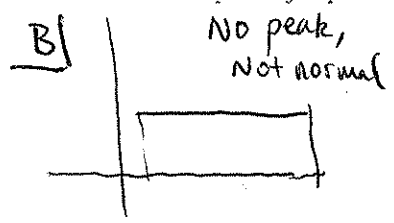
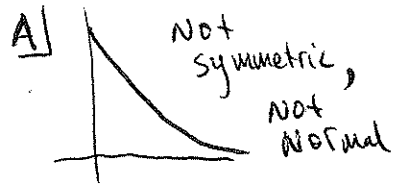
$$1.1 + (-2.33)(0.2) =$$

$$= 0.63 \text{ lbs}$$

5 points



(11) Of the five sketches of histograms A, B, C, D, E, (see chalkboard in class), which could not possibly represent a normally distributed variable?



could be normal

could be normal

5 points

(12) Of the histograms C and D on the chalkboard, which has the larger standard deviation? (Assuming the scale is the same on both sets of axes.)

D - wider spread
Means higher SD.

5 points

(13) Of the two sets of values: {100, 101, 102, 99, 98} and {0, 10, 20, -10, -20}, which has the larger standard deviation? (You don't need to calculate anything.)

points separated by 1

points separated by 10,
wider spread,
higher SD.