HW 6 – NORMAL DISTRIBUTION BY HAND

NAME key spring 16

Convert the following z – scores into proportions:

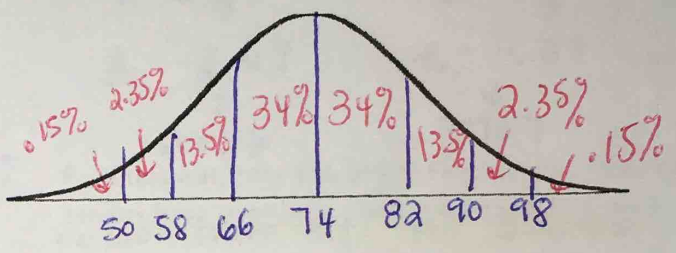
1. $z = -1.25$ → .1056
2. $Z = 3.01$ → .9987
3. $Z = -0.82$ → .2061
4. $Z = 0.07$ → .5279
5. $Z = -3.39$ → .0003

Convert the following proportions into z – scores:

6. bottom 30% → −.52
7. Top 13% *look for .87 → 1.13
8. Bottom 5% → −1.645
9. Top 33% *look for .67 → 0.44
10. Bottom 18% → −.92

11. The results of an AFM test are normally distributed with a mean of 74 and a standard deviation of 8. Find the following:

a. Draw a normal distribution curve. Fill in your percents based on the empirical rule.



b. Find the % of students who made below a 60.

$z = \frac{60-74}{8} = -1.75$ → .0401 ~4.1%

c. Find the % of students who made over a 92

$z = \frac{92-74}{8} = 2.25$ look up on table → .9878

$1 - .9878 = .0122 \sim 1.22\%$

d. Find the % of students who made between a 70 and 79

$z = \frac{70-74}{8} = -.5$ → .3085

$z = \frac{79-74}{8} = .625 \sim .63$ → ~.7357

$.7357 - .3085 = .4272 \sim 42.72\%$

e. If 65 students took the test, how many made above an 80?

$z = \frac{80-74}{8} = .75 \rightarrow .7734$

$1 - .7734 = .2266$

$(.2266)(65) = 14.729 \sim 15$ students

F. What grade do you need to be in the top 20% of the class?

look in table for .80

closest value = .7995 → $z = 0.84$

$.84 = \frac{x-74}{8}$

$6.72 = x - 74$

$x = 80.72$

G. What is the max grade needed to fall in the bottom 25%?

look in table for .25

closest value: .2514 → $z = -0.67$

$-0.67 = \frac{x-74}{8}$

$-5.36 = x - 74$

$x = 68.64$

H. What grade do you need to be in the top 5%?

look in table for .95

split between 2 values: .9495 | .9505

$z = 1.645$

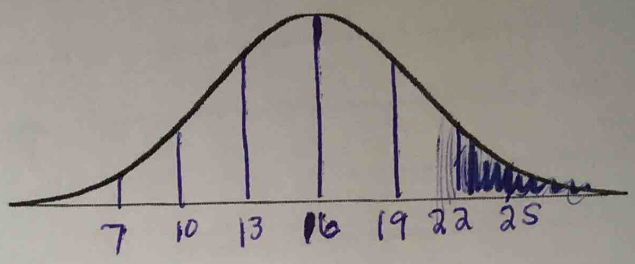
$1.645 = \frac{x-74}{8}$

$13.16 = x - 74$

$x = 87.16$

12. The average number of times a person has been on a plane is 16 with a st. dev. of 3. Find the following.

a. Draw a normal distribution curve. Fill in your percents based on the empirical rule.



b. Find the % of people who have been on a plan less than 9 times.

$z = \frac{9-16}{3} = -2.33$ look @ table

↓

.0099 or .99%

c. % of people who have been on a plane over 22 times.

$z = \frac{22-16}{3} = 2$ look @ table

↓

.9772

$1 - .9772 = .0228$ 2.28%

D. % between 8 and 15 times on a plane.

$z = \frac{8-16}{3}$ $z = \frac{15-16}{3}$

$z = -2.67$ $z = -.33$

↓ ↓

.0038 .3707

.3707 − .0038

.3669

36.69%

E. % between 12 and 18 times on a plane.

$z = \frac{12-16}{3}$ $z = \frac{18-16}{3}$

$z = -1.33$ $z = .67$

↓ ↓

.0918 .7486

.7486 − .0918 = .6568 65.68%

F. If this was from a survey of FVHS seniors, how many seniors have been on a plane more than 20 times?

assume there are 400 seniors

$z = \frac{20-16}{3}$

$z = 1.33$

↓

.9082

1 − .9082

.0918

~37 seniors

(.0918)(400) = 36.72

G. Find max # of times to be in bottom 10%

look @ table for .10

closest value = .1003 → $z = -1.28$

$-1.28 = \frac{x-16}{3}$ $-3.84 = x - 16$

$x = 12.16$ ~12 times

H. Find min # of times to be in top 18%

look @ table for .82

closest value = .8212 → $z = 0.92$

$0.92 = \frac{x-16}{3}$ $2.76 = x - 16$

$x = 18.76$ ~19 times

I. % of people less than 5 times on a plane

$z = \frac{5-16}{3}$

$z = -3.67$ → .0001

.01%

J. % of people more than 19 times on a plane

$z = \frac{19-16}{3}$

$z = 1$ → .8413

15.87%

1 − .8413 = .1587

K. Min # of times to be in top 35%

look @ table for .65

closest value = .6517 → $z = .39$

$.39 = \frac{x-16}{3}$ $1.17 = x - 16$

$x = 17.17$

~17 times

L. Find max # of times to be in bottom 5%

look at table for .05

split between two values: .0505 | .0495

$z = -1.645$

$-1.645 = \frac{x-16}{3}$ $x = 11.065$

$-4.935 = x - 16$

~11 times