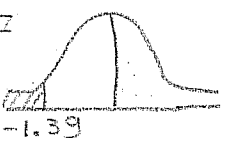
NAME SOLUTIONS

Bonus Exercises – Standard Normal Distribution
201-934-DW Business Statistics
Friday September 25th 2009

1 - Given the standard normal distribution find the following probabilities:

(a) P(z > – 0.1) = 0.5+0.0398=0.5398

(b) P(z < – 1.39) = 0.5 – 0.4177 = 0.0823



(c) P(– 2.04 < z < 0) = 0.4793

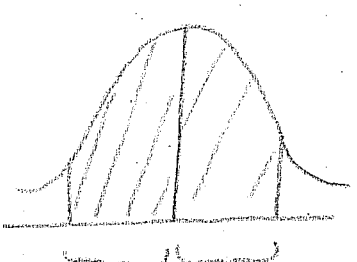
(d) P(– 0.15 < z < 2.1) = 0.0596 + 0.4821 = 0.5417

(e) P(0.71 < z < 0.93) = 0.3238 – 0.2611 = 0.0627

(f) P(z > 0.78) = 0.5 – 0.2823 = 0.2177

(g) P(0 < z < 1.27) = 0.3980

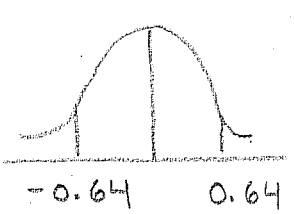
2 - What z values bound the middle 48% of area under the standard normal curve?



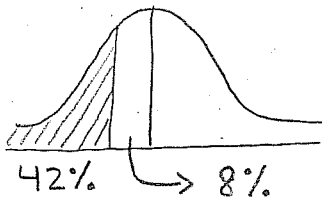
24% 24%

Look up 0.24 in table (as an area)

Z = 0.64



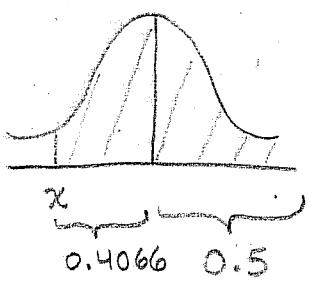
3 - What is the z-score associated with the 42nd percentile of a normal distribution?



(Look up 0.08 value in table as area)

$z = -0.20$

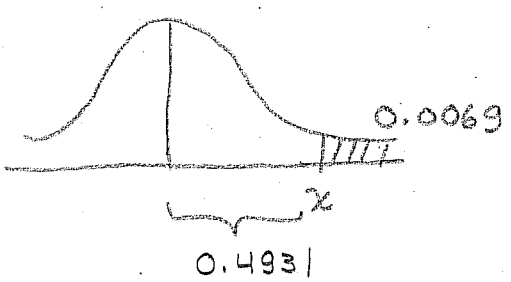
4 – Find the value of x if P(z > x) = 0.9066 in the standard normal distribution.



$x = 1.32$

$P(z > 1.32) = 0.9066$

5 – Find the value of x if P(z > x) = 0.0069 in the standard normal distribution.



$x = 2.46$

$P(z > 2.46) = 0.0069$

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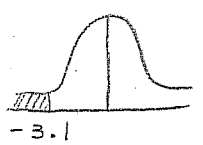
1 - Given the standard normal distribution find the following probabilities:

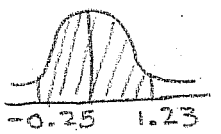
(a) P(z > – 0.82) = 0.5 + 0.2939 = 0.7939

(b) P(z < – 3.1) = 0.5 – 0.4990 = 0.0010



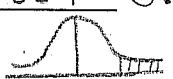
(c) P(– 2.16 < z < 0) = 0.4846

(d) P(– 0.25 < z <1.23) = 0.0987 + 0.3907 = 0.4894

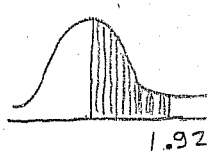


(e) P(0.54 < z < 1.28) = 0.3997 – 0.2054 = 0.1943

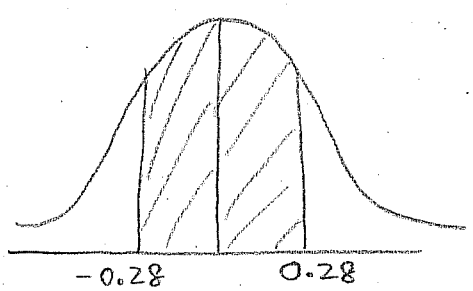
(f) P(z > 1.27) = 0.5 – 0.3980 = 0.102



(g) P(0 < z < 1.92) = 0.4726



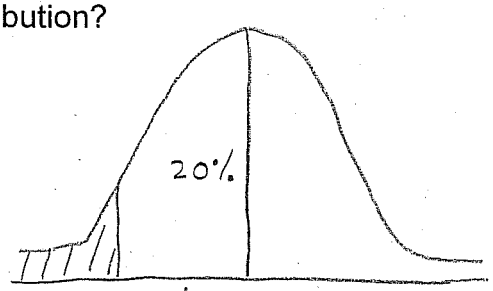
2 - What z values bound the middle 22% of area under the standard normal curve?



11% 11% Look for z-value closest to 0.11

(Z = 0.28)

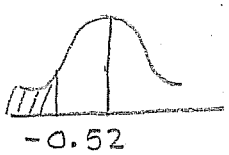
3 - What is the z-score associated with the 30th percentile of a normal distribution?



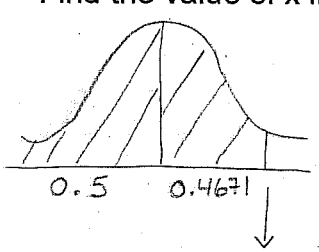
30% OF DATA MUST be here

Look for value close to 0.20

(Z = 0.52)



4 – Find the value of x if P(z < x) = 0.9671 in the standard normal distribution.

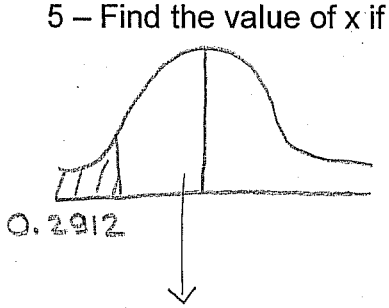


Find z value corresponding TO 0.4671

it is 1.84

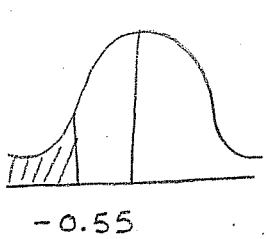
P(Z < 1.84) = 0.9671

5 – Find the value of x if P(z < x) = 0.2912 in the standard normal distribution.



0.2088

Z = 0.55



P(z < -0.55) = 0.2912

NAME SOLUTIONS

Bonus Exercises – Standard Normal Distribution
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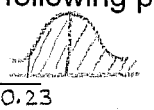
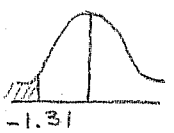
1 - Given the standard normal distribution find the following probabilities:

(a) P(z > – 0.23) = 0.5 + 0.0910 = 0.591

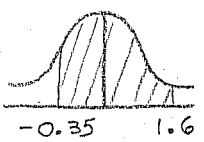


(b) P(z < – 1.31) = 0.5 – 0.4049 = 0.0951



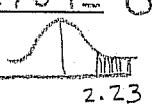
(c) P(– 0.76 < z < 0) = 0.2764

(d) P(– 0.35 < z <1.6) = 0.1368 + 0.4452 = 0.582



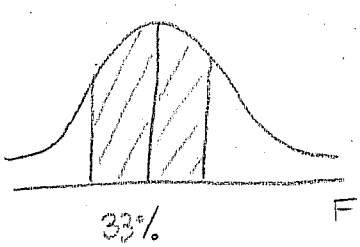
(e) P(0.75 < z < 1.23) = 0.3907 – 0.2734 = 0.1173

(f) P(z > 2.23) = 0.5 – 0.4871 = 0.0129



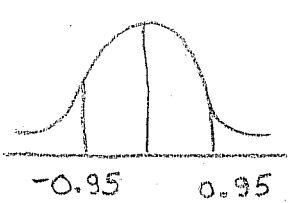
(g) P(0 < z < 2.16) = 0.4846

2 - What z values bound the middle 66% of area under the standard normal curve?

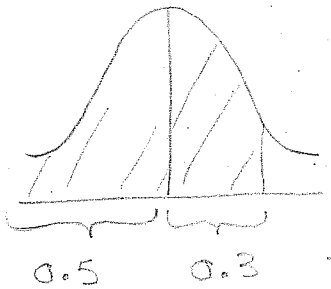


Find 0.33 Area in table

Z = 0.95



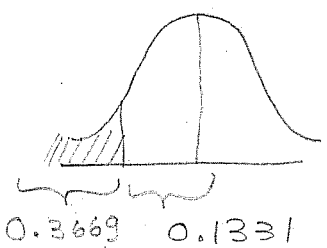
3 - What is the z-score associated with the 80th percentile of a normal distribution?



→ Look up 0.3 Area in TABLE

$Z = 0.84$

4 – Find the value of x if P(z < x) = 0.3669 in the standard normal distribution.



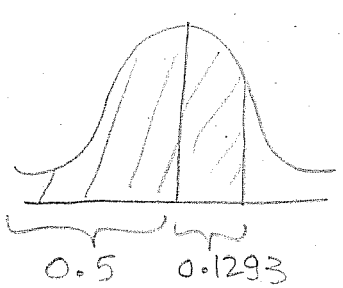
Look up Area of 0.1331 IN TABLE

$Z = 0.34$

So $P(Z < -0.34) = 0.3669$

$K = -0.34$

5 – Find the value of x if P(z < x) = 0.6293 in the standard normal distribution.



Look up AREa 0.1293 IN TABLE

$Z = 0.33$

$P(Z < 0.33) = 0.6293$

So $K = 0.6293$

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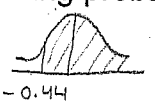
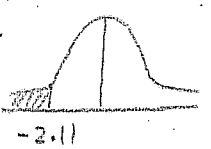
1 - Given the standard normal distribution find the following probabilities:

(a) P(z > – 0.44) = 0.5+0.1700 = 0.67



(b) P(z < – 2.11) = 0.5-0.4826 = 0.0174



(c) P(– 1.76 < z < 0) = 0.4608

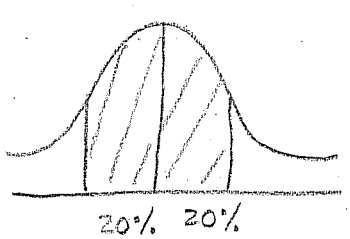
(d) P(– 0.35 < z <1.1) = 0.1368 + 0.3643 = 0.5011

(e) P(0.25 < z < 1.63) = 0.4484 – 0.0987 = 0.3497

(f) P(z > 2.2) = 0.5 – 0.4861 = 0.0139

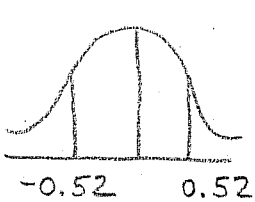
(g) P(0 < z < 2.86) = 0.4979

2 - What z values bound the middle 40% of area under the standard normal curve?

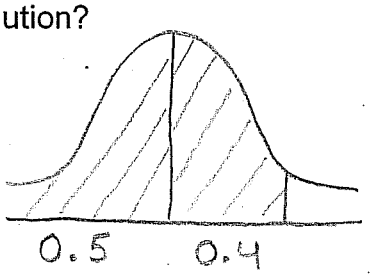


Look up 0.20 area in table

z = 0.52

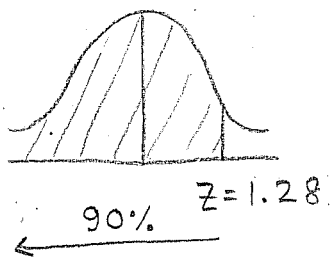


3 - What is the z-score associated with the 90th percentile of a normal distribution?

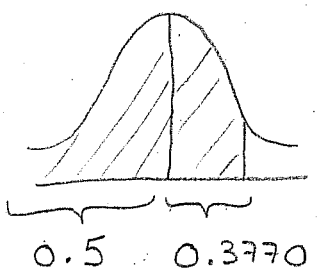


Look up area 0.4 in table

$Z = 1.28$



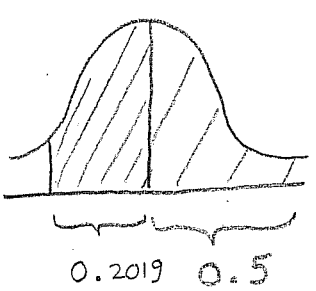
4 – Find the value of x if P(z < x) = 0.8770 in the standard normal distribution.



$x = 1.16$

$P(Z < 1.16) = 0.8770$

5 – Find the value of x if P(z > x) = 0.7019 in the standard normal distribution.



$x = -0.53$

$P(z > -0.53) = 0.7019$