
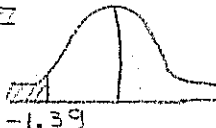


NAME SOLUTIONS (PURPLE COPY)

Bonus Exercises – Standard Normal Distribution  
201-934-DW Business Statistics  
Friday September 25<sup>th</sup> 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)  $P(-2.04 < z < 0) = 0.4793$

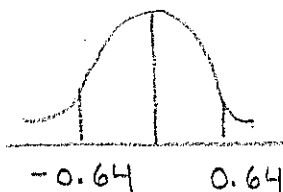
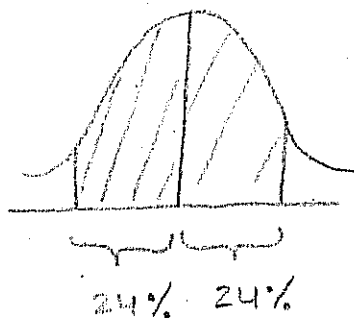
(d)  $P(-0.15 < z < 2.1) = 0.0596 + 0.4821 = 0.5417$

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

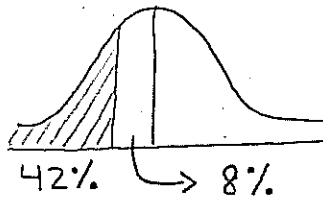
2 - What z values bound the middle 48% of area under the standard normal curve?



Look up 0.24 in TABLE  
(AS AN AREA)

$$Z = 0.64$$

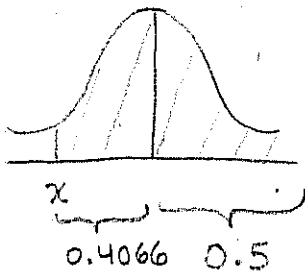
3 - What is the z-score associated with the 42<sup>nd</sup> percentile of a normal distribution?



$$z = -0.20$$

(Look up 0.08 value in table as area)

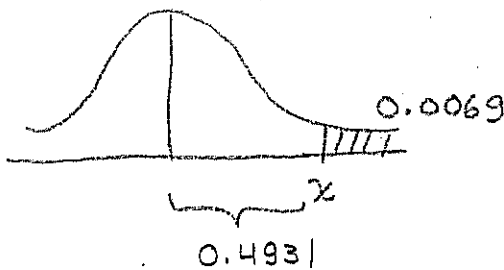
4 - Find the value of x if  $P(z > x) = 0.9066$  in the standard normal distribution.



$$x = 1.32$$

$$P(z > 1.32) = 0.9066$$

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



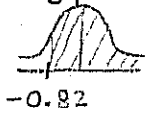
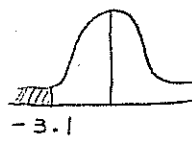
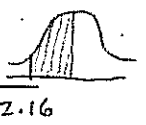
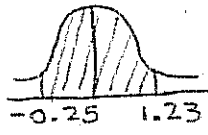
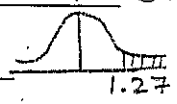
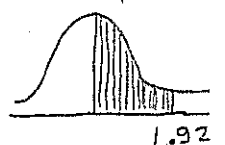
$$x = 2.46$$

$$P(z > 2.46) = 0.0069$$

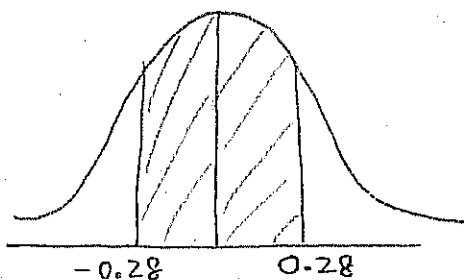
NAME SOLUTIONS (GREEN COPY)

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

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

- (a)  $P(z > -0.82) = \underline{0.5 + 0.2939 = 0.7939}$  
- (b)  $P(z < -3.1) = \underline{0.5 - 0.4990 = 0.001}$  
- (c)  $P(-2.16 < z < 0) = \underline{0.4846}$  
- (d)  $P(-0.25 < z < 1.23) = \underline{0.0987 + 0.3907 = 0.4894}$  
- (e)  $P(0.54 < z < 1.28) = \underline{0.3997 - 0.2054 = 0.1943}$
- (f)  $P(z > 1.27) = \underline{0.5 - 0.3980 = 0.102}$  
- (g)  $P(0 < z < 1.92) = \underline{0.4726}$  

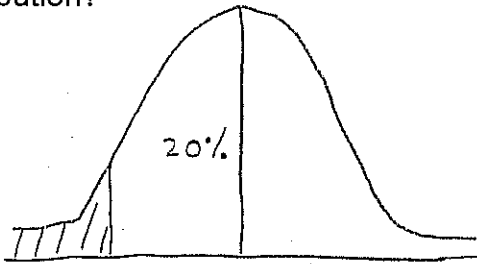
2 - What z values bound the middle 22% of area under the standard normal curve?



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

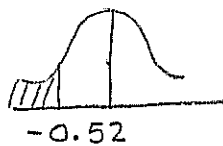
(z = 0.28)

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

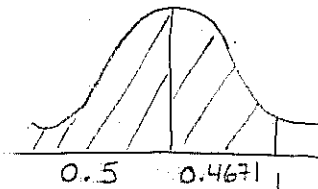


30% OF DATA MUST be here

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.

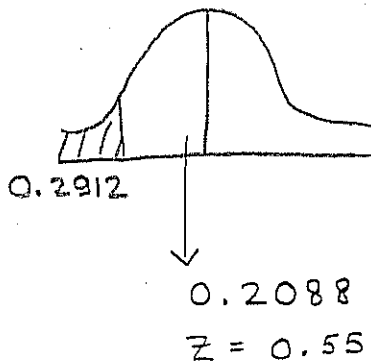


Find z value corresponding  
TO 0.4671

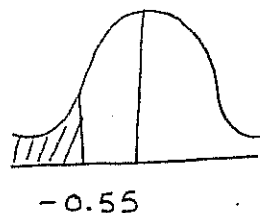
it is 1.84

$$P(Z < 1.84) = 0.9671$$

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



0.2088  
 $Z = 0.55$

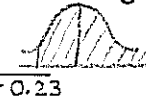

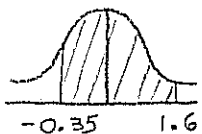
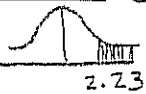


$$P(Z < -0.55) = 0.2912$$

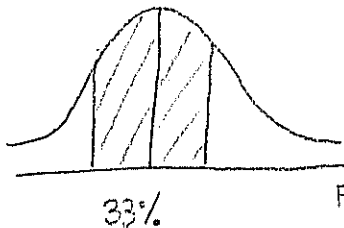
NAME SOLUTIONS (ORANGE COPY)

**Bonus Exercises – Standard Normal Distribution**  
**201-934-DW Business Statistics**  
**Friday September 25<sup>th</sup> 2009**

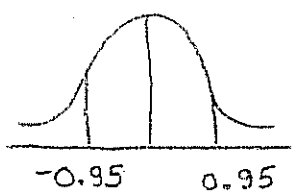
1 - Given the standard normal distribution find the following probabilities:

- (a)  $P(z > -0.23) = \underline{0.5 + 0.0910 = 0.591}$  
- (b)  $P(z < -1.31) = \underline{0.5 - 0.4049 = 0.0951}$  
- (c)  $P(-0.76 < z < 0) = \underline{0.2764}$
- (d)  $P(-0.35 < z < 1.6) = \underline{0.1368 + 0.4452 = 0.582}$  
- (e)  $P(0.75 < z < 1.23) = \underline{0.3907 - 0.2734 = 0.1173}$
- (f)  $P(z > 2.23) = \underline{0.5 - 0.4871 = 0.0129}$  
- (g)  $P(0 < z < 2.16) = \underline{0.4846}$

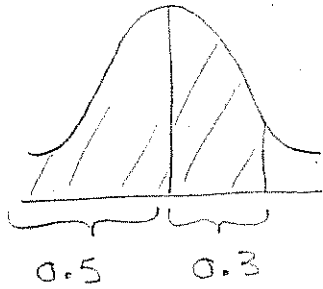
2 - What z values bound the middle 66% of area under the standard normal curve?



Find 0.33 Area in table  
 $Z = 0.95$



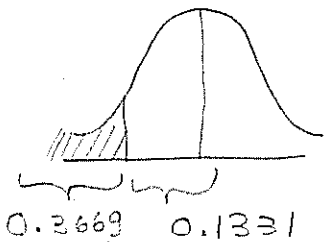
3 - What is the z-score associated with the 80<sup>th</sup> percentile of a normal distribution?



→ 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.



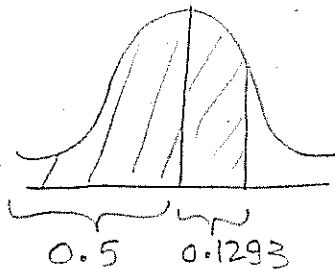
Look up Area of 0.1331  
IN TABLE

$$z = 0.34$$

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

$$x = -0.34$$

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



Look up Area 0.1293 IN  
TABLE

$$z = 0.33$$

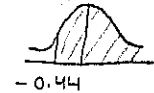
$$P(z < 0.33) = 0.6293$$

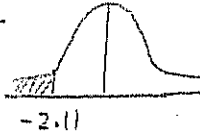
So  $x = 0.6293$

NAME SOLUTIONS (BLUE COPY)

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

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

(a)  $P(z > -0.44) = \underline{0.5 + 0.1700 = 0.67}$  

(b)  $P(z < -2.11) = \underline{0.5 - 0.4826 = 0.0174}$  

(c)  $P(-1.76 < z < 0) = \underline{0.4608}$

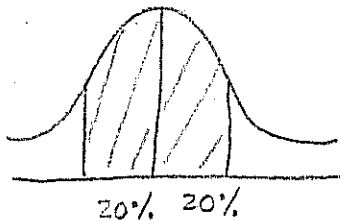
(d)  $P(-0.35 < z < 1.1) = \underline{0.1368 + 0.3643 = 0.5011}$

(e)  $P(0.25 < z < 1.63) = \underline{0.4484 - 0.0987 = 0.3497}$

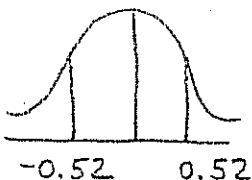
(f)  $P(z > 2.2) = \underline{0.5 - 0.4861 = 0.0139}$

(g)  $P(0 < z < 2.86) = \underline{0.4979}$

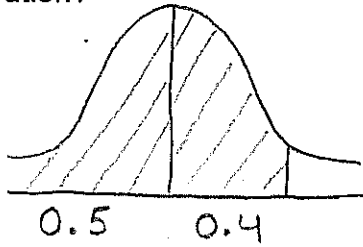
2 - What z values bound the middle 40% of area under the standard normal curve?



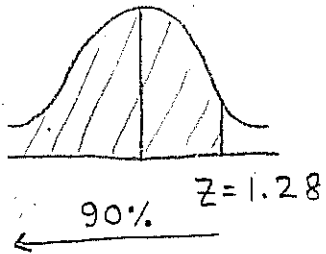
Look up 0.20 area  
in table  
 $z = 0.52$



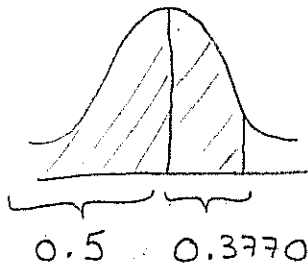
3 - What is the z-score associated with the 90<sup>th</sup> percentile of a normal distribution?



Look up Area 0.4 in table  
 $Z = 1.28$



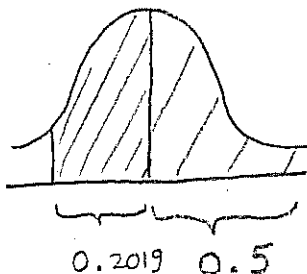
4 - Find the value of x if  $P(z < x) = 0.8770$  in the standard normal distribution.



$$x = 1.16$$

$$P(Z < 1.16) = 0.8770$$

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



$$x = -0.53$$

$$P(Z > -0.53) = 0.7019$$