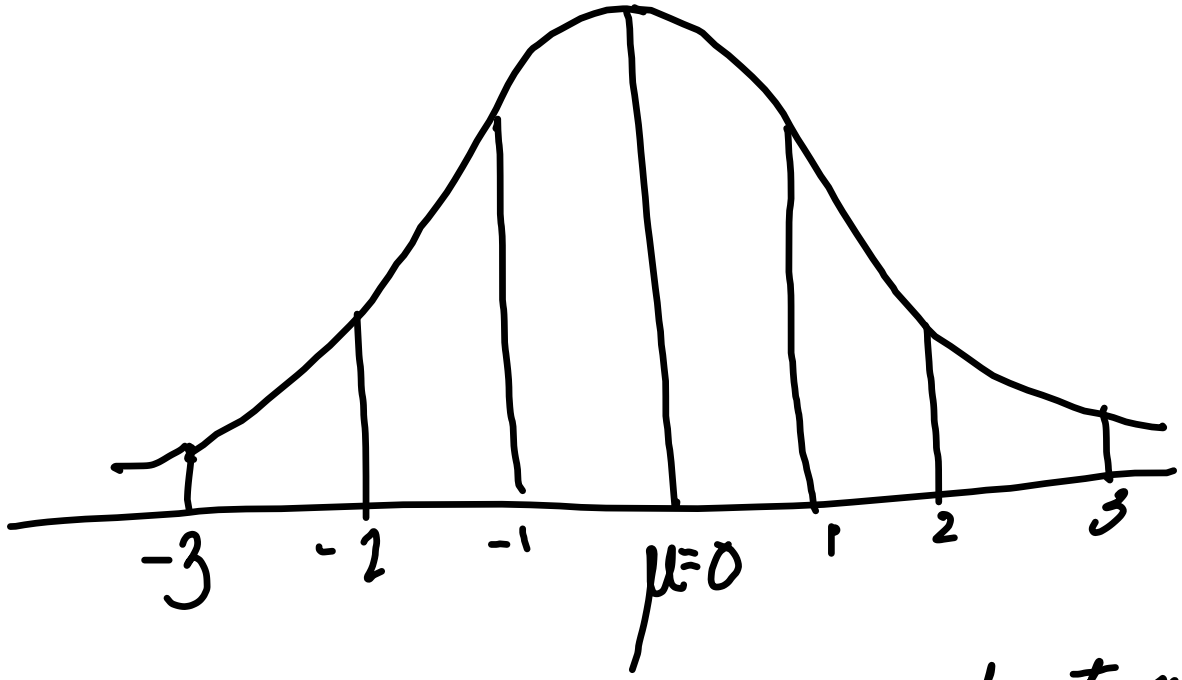
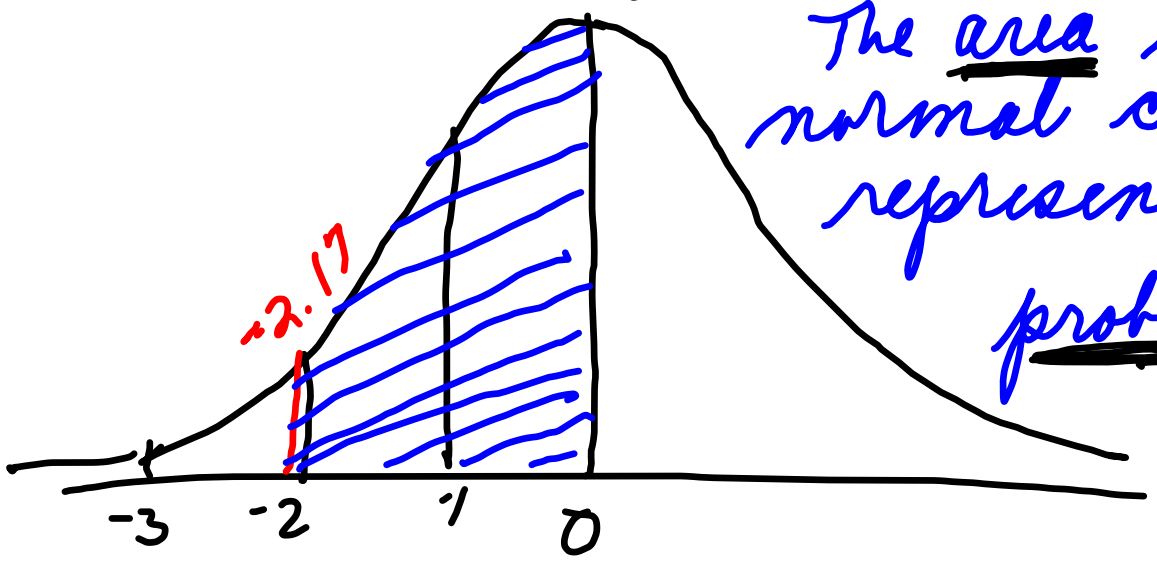
Z values

Standard Normal Distribution



z values are the # of standard deviations from μ, the mean.

(24) Find the area under the standard normal curve from $z = -2.17$ to $z = 0$



The area under a normal curve represents the probability

$P(-2.17 < z < 0) = \text{normalcdf}(-2.17, 0, 0, 1)$

$\approx .4850$

(EX) Find the following for the standard normal

a) $P(1.19 < z < 2.12) =$

normalcdf(1.19, 2.12, 0, 1)

low high μ σ

$\approx .1000$

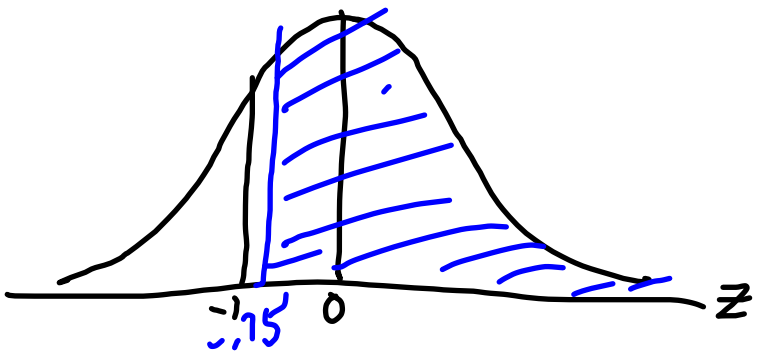
b) $P(-1.56 < z < 2.31)$

$=$ normalcdf(-1.56, 2.31, 0, 1)

$\approx .9302$

c) $P(z > -.75) =$ normalcdf(-.75, E99, 0, 1)

$\approx .7734$



ex 6.42 pg 274

$\mu = 845$

$\sigma = 270$

a) $P(1000 < x < 1400)$

= normalcdf (1000, 1400, 845, 270)
(mean, sd.)

$\approx .2630$

b) What percentage have a balance of \$750 or more?

$P(x \geq 750)$ = normalcdf (750, E99, 845, 270)

$\approx .6375$

63.75% have a balance greater than or equal to \$750.

(4) 6.30 with $\mu = 12$ and $\sigma = 2$

a) Area between $x = 7.76$ and $x = 12$

$P(7.76 < x < 12) = \text{normalcdf}(7.76, 12, 12, 2)$

$\approx .4830$

b) Area between $x = 14.48$ and $x = 16.54$

$P(14.48 < x < 16.54) = \text{normalcdf}(14.48, 16.54, 12, 2)$

$\approx .0959$

→ c) Area from $x = 8.22$ to $x = 10.06$

$P(8.22 < x < 10.06) = \text{normalcdf}(8.22, 10.06, 12, 2)$

$\approx .1366$

#6.36 $\mu = 65$ and $\sigma = 15$

a) less than 43

$P(x < 43) = \text{normalcdf}(-E99, 43, 65, 15)$

$\approx .0712$

b) greater than 74

$P(x > 74) = \text{normalcdf}(74, E99, 65, 15)$

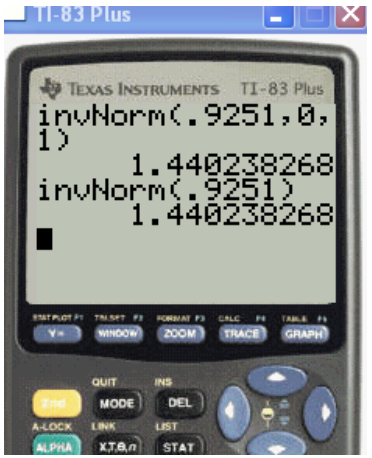
$\approx .2743$

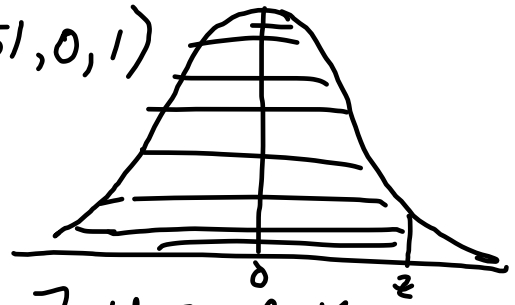
6.6 Determine z and x values when the area (i.e. the probability) is known.

(ex) Find z if the area to left of z is .9251

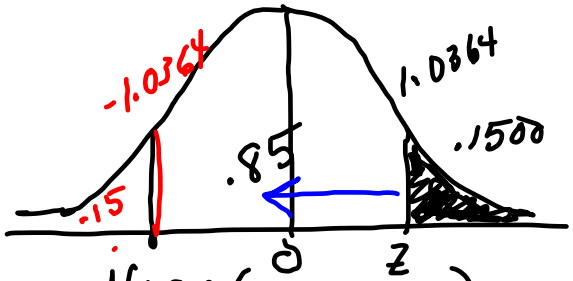
$z = \text{invNorm}(.9251, 0, 1)$

≈ 1.4402





(ex) Find z if the area to the right of z = .1500



$z = \text{invNorm}(1-.15, 0, 1)$

$= \text{invNorm}(.85, 0, 1)$

≈ 1.0364

pg 277 example in book

Life of a TI calculator

$\mu = 54$ months

$\sigma = 8$ months

What the warranty period be if TI does not want to replace more than 1% of calculators

x = life of calculator

$\mu = 54$ mo.

$\sigma = 8$ mo

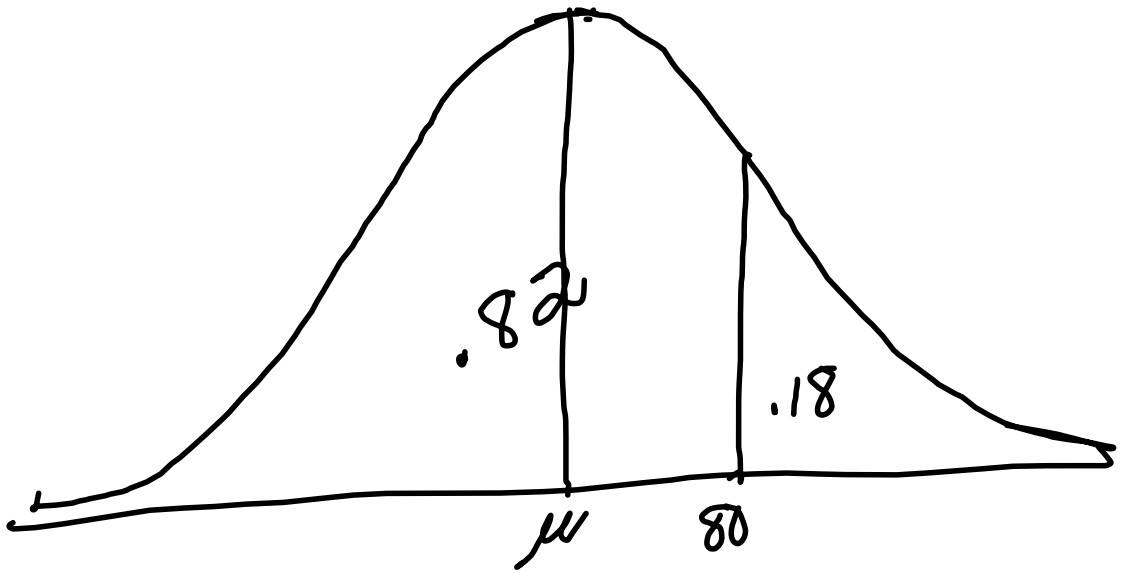
1% = .01 area under the normal curve

$x = \text{invNorm}(.01, 54, 8)$

≈ 35.39 months

≈ 35 months

(ex) Suppose I know that 18% of my students scored above 80 on the last test with a standard deviation of 8. What was the mean?



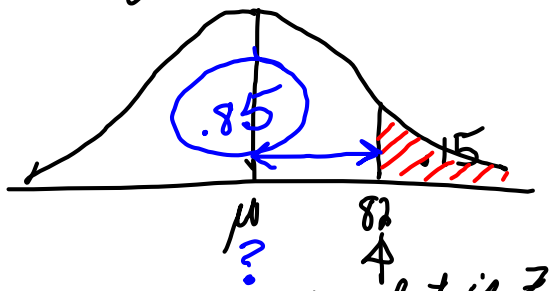
$z = \text{invNorm}(.82)$

$\approx .9154$ (how many sd.)

$\mu = 80 - .9154(8)$

≈ 72.68

Suppose 15% of my students scored above 82, the standard deviation of 6. Find the mean.



$\sigma = 6$

what is z value?

$z = \text{invNorm}(.85)$

≈ 1.0364

the number of standard deviations above the mean

$\mu = 82 - 1.0364(6)$

#of σ's $\quad \sigma$

$= 82 - 6.2184$

≈ 75.78