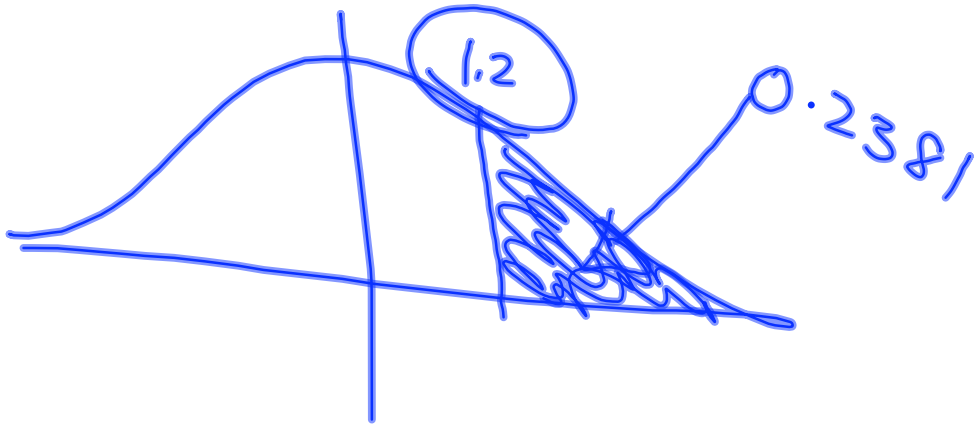
Day 4: Modeling Using Normal Distribution

When we want to find the area under the normal curve given information to find the z-scores we use a function in calculator called normalcdf(.

Eg 1) Find the area under the curve for a z-score larger than or equal to 1.2.

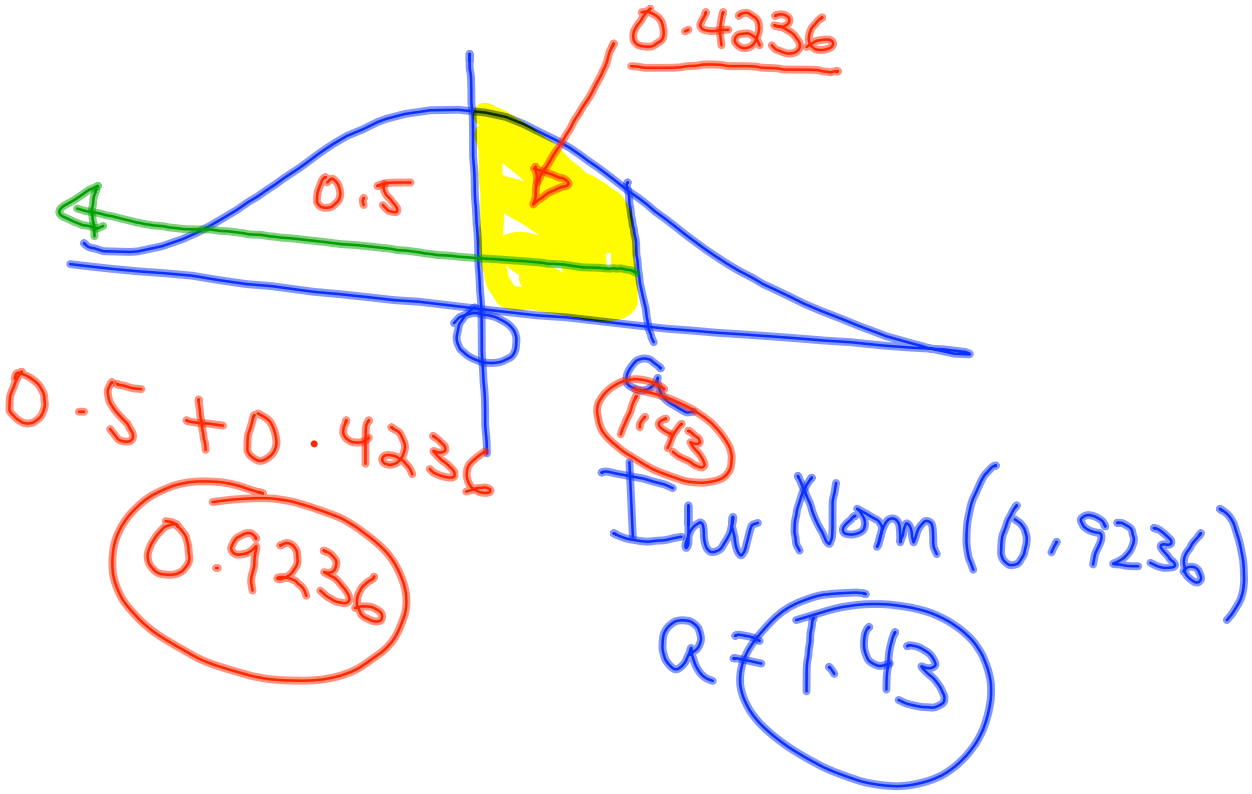


Sometimes you are going to be given the area under the curve and have to use this to find a z - score. We need to use a command called invNorm on our calculator to take an area and find its z-score. It is EXTREMELY important to note that **InvNorm considers the ENTIRE area to the left of a PARTICULAR z-score.**

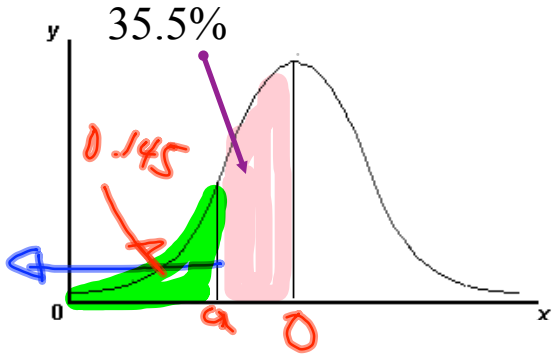
Eg 2) Find the value of "a" for the following situation $0 \le z \le a = 0.4236$

1.43

**It is VERY important to draw a diagram for the situation



Eg 3) Find the z-score for the following given:



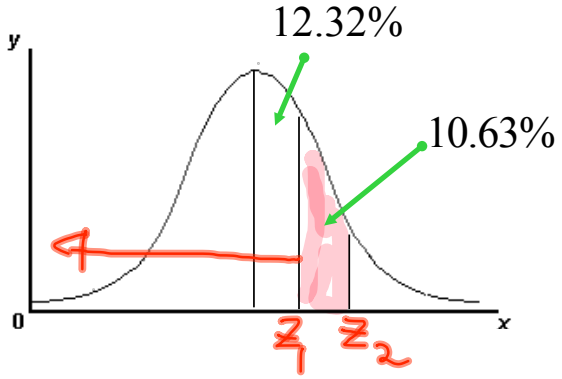
$0.5 - 0.355$

$.145$

InvNorm(0.145)

-1.06

Eg 4) Find the z-score for the following given:



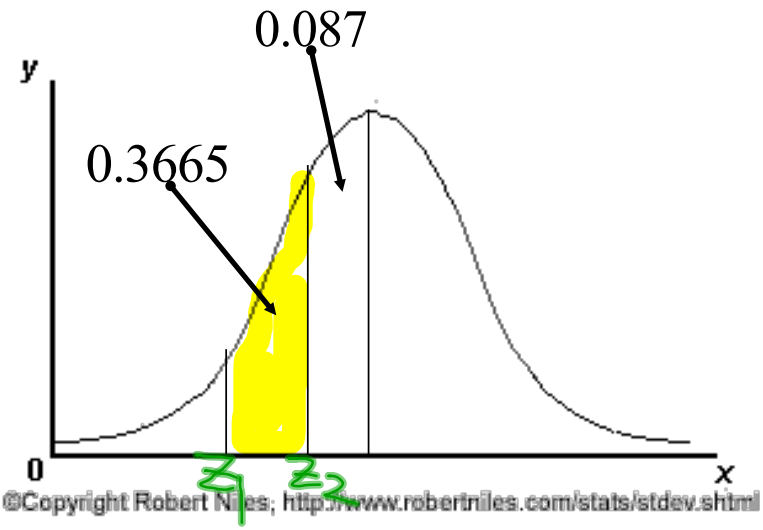
$z_1 = 0.5 + 0.1232 = 0.6232$

InvNorm(0.6232) = 0.31

$z_2 = 0.5 + 0.1232 + 0.1063 = 0.7295$

$z_2 = 0.61$

Find the z-score for the following given:



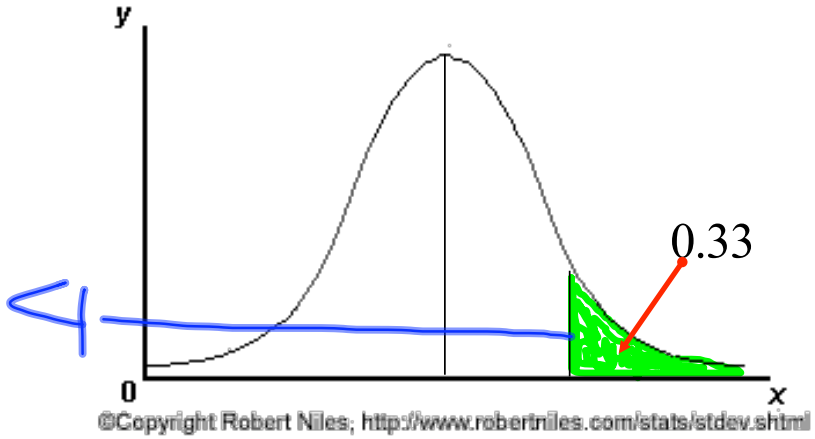
$z_1 = 0.5 - 0.3665 - 0.1087 = 0.0465$

InvNorm(0.0465) = -1.68

$z_2 = 0.5 - 0.087 = 0.413$

$z_2 = -0.22$

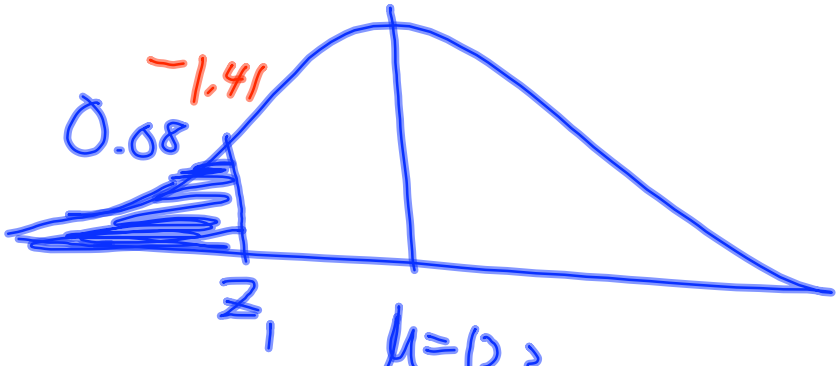
Find the z-score for the following given:



$1 - 0.33 = 0.67$

InvNorm(0.67)

Eg 5) A manufacturer produces some useless piece of electronics and finds that it has a mean life of 12.3 years and standard deviation of 2.9 years. If the data is normally distributed, then what guarantee should the maufacturer give so that fewer than 8% of the units will be returned?



$\mu = 12.3$

$\sigma = 2.9$

InvNorm(0.08) = −1.41

$$z = \frac{x - \mu}{\sigma}$$

$$-1.41 = \frac{x - 12.3}{2.9}$$

$x = 8.21$

Assignment: Handout