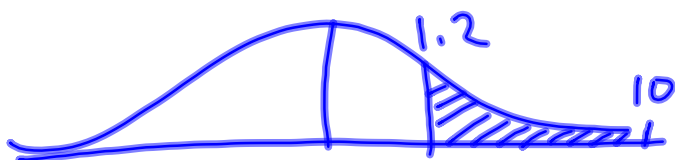


Day 4: Using InvNorm

using area to find z-score

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.



```
normalcdf(10,15)
.252492467
normalcdf(1.2,10)
.1150697316
```

■

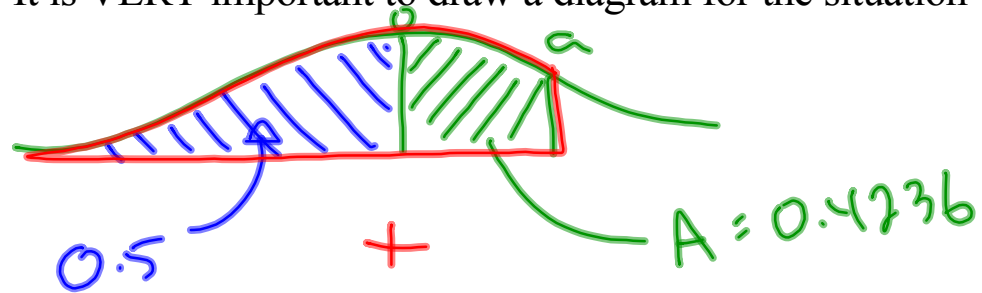
Normalcdf(1.2, 10)
= 0.1151
or
11.51%

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 $0 \leq z \leq a = 0.4236 = A$

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



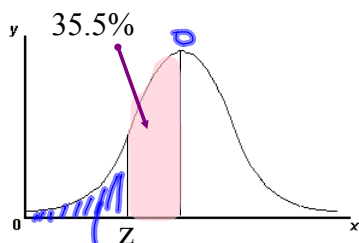
$$= 0.9236$$

$$\text{InvNorm}(0.9236)$$

$$a = 1.43$$

```
normalcdf(10/15▶
.252492467
normalcdf(1.2, 1▶
.1150697316
invNorm(.9236)
1.429710937
```

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

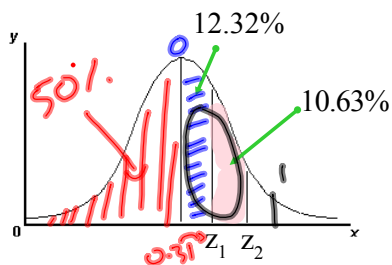


$$\begin{array}{r} 50\% \\ - 35.5\% \\ \hline 14.5\% \end{array}$$

$$\text{InvNorm}(0.145)$$

$$Z = -1.06$$

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



$$A(z_1) = 50\% + 12.32\% = 62.32\%$$

$$\text{InvNorm}(0.6232) = 0.31$$

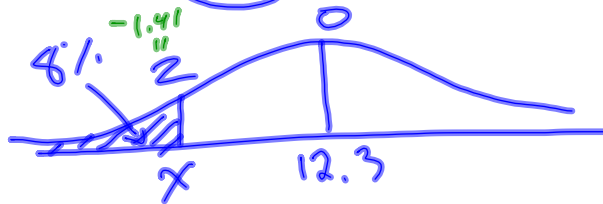
$$A(z_2) = 62.32\% + 10.63\%$$

$$= 72.95\%$$

$$\text{InvNorm}(0.7295)$$

$$Z_2 = 0.61$$

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 manufacturer give so that fewer than 8% of the units will be returned?



$$\textcircled{1} \text{InvNorm}(0.08)$$

$$z = -1.41$$

$$\textcircled{2} z = \frac{x - \mu}{\sigma}$$

$$\uparrow (-1.41) = \frac{x - 12.3}{2.9}$$

$$(2.9)(-1.41) = x - 12.3$$

$$(2.9)(-1.41) + 12.3 = x$$

$$8.2 = x$$

8 year guarantee.

Assignment:
Pg. 233 #4-6
Pg. 239 #4-9, 11