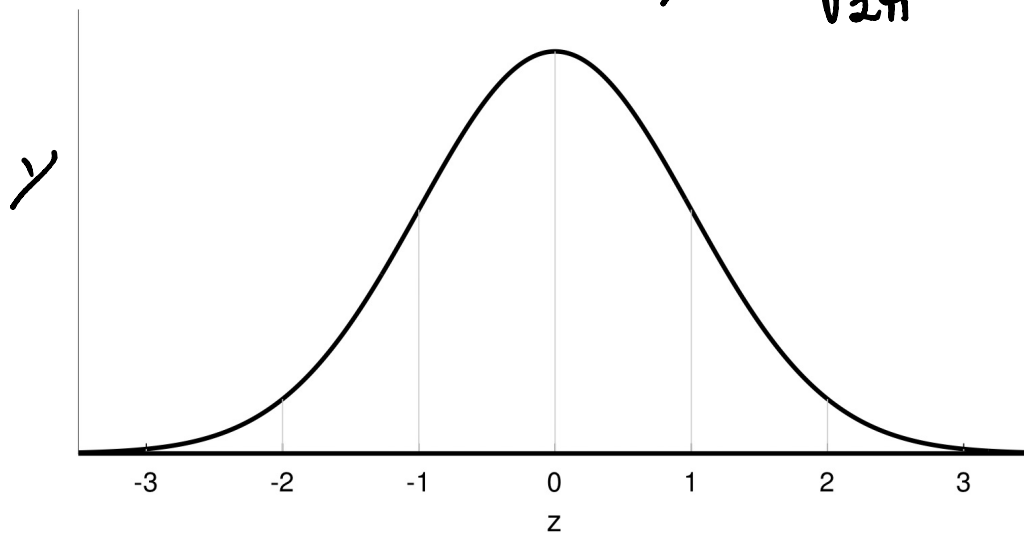


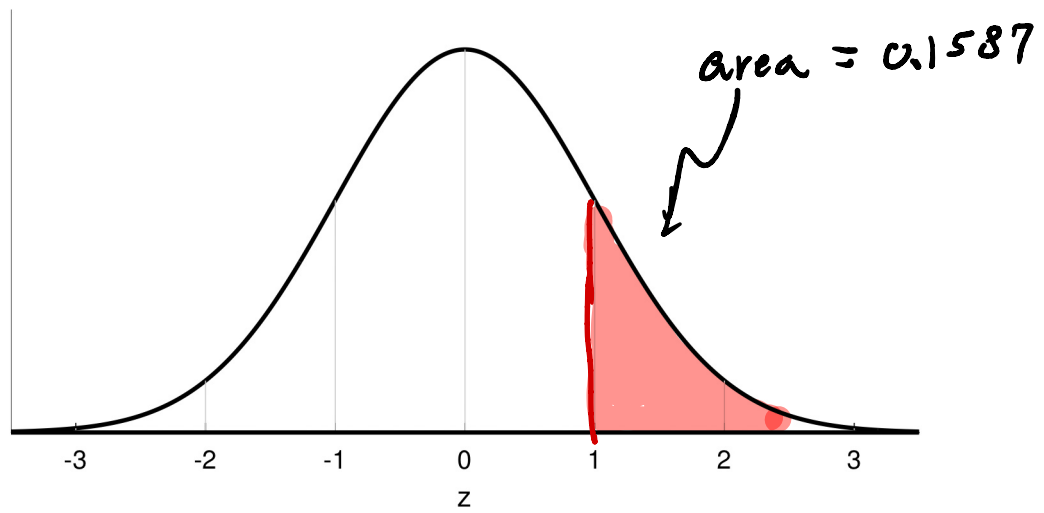
Normal distributions can be defined by their mean, μ , and standard deviation, σ

The standard normal distribution has $\mu = 0$
 $\sigma = 1$

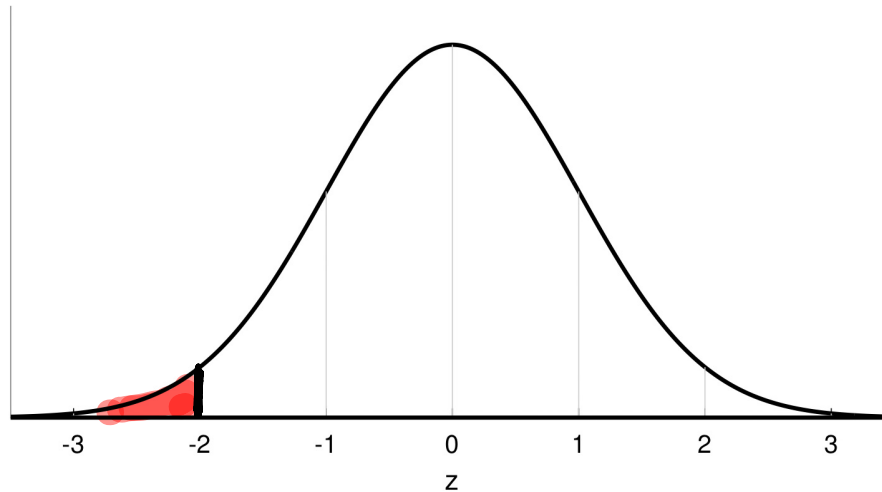
$$y = \frac{e^{-z^2}}{\sqrt{2\pi}}$$



Example: find the area above $z=1$.

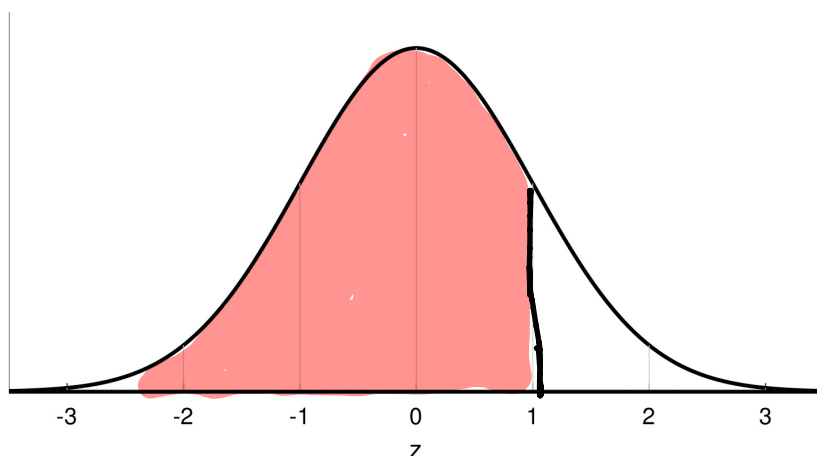


Example: What is the area under the standard normal distribution below $z = -2$?



$z = -2$, area below is the same as...
area above $z = 2$ which is... .0228

Example: Find the area under the standard normal distribution below $z = 1$:

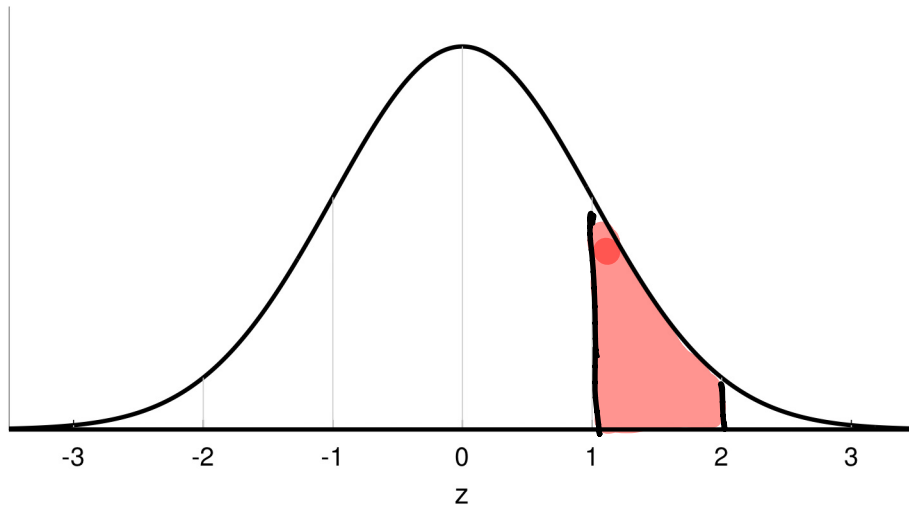


two ways:

1) Find area above $z = 1$, then subtract it from 1
$$\text{area} = 1 - 0.1587 = 0.8413$$

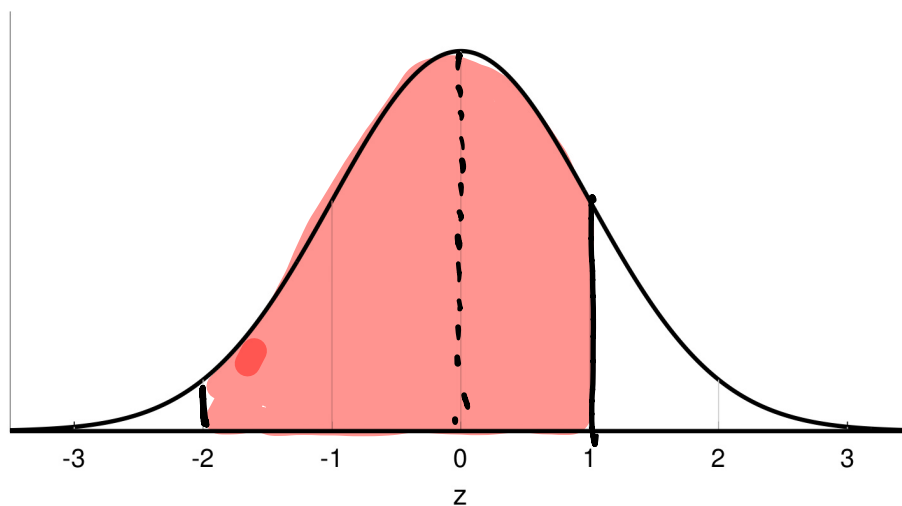
2) Find area between 0 and 1 and add 0.5
$$\text{area} = 0.2413 + 0.5 = \underline{0.8413}$$

Example: What is the area under the standard normal distribution between 1 and 2?



$$\begin{aligned} \text{area above } z=1 &- \text{area above } z=2 \\ &= 0.1587 - 0.0228 = 0.1359 \end{aligned}$$

Example: What is the area under the standard normal between $z = -2$ and 1 ?

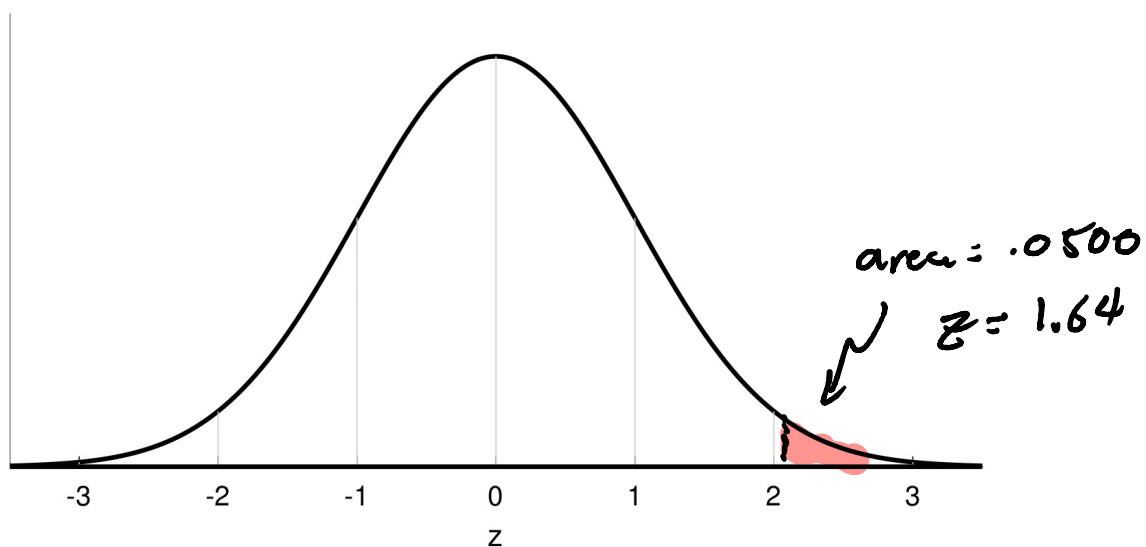


area : area between $z=0$ & 1 , +
area between $z=0$ & -2 \swarrow same as area between $z=0$ & 2

$$= 0.3413 + 0.4772 = 0.8185$$

Finding z-scores from areas

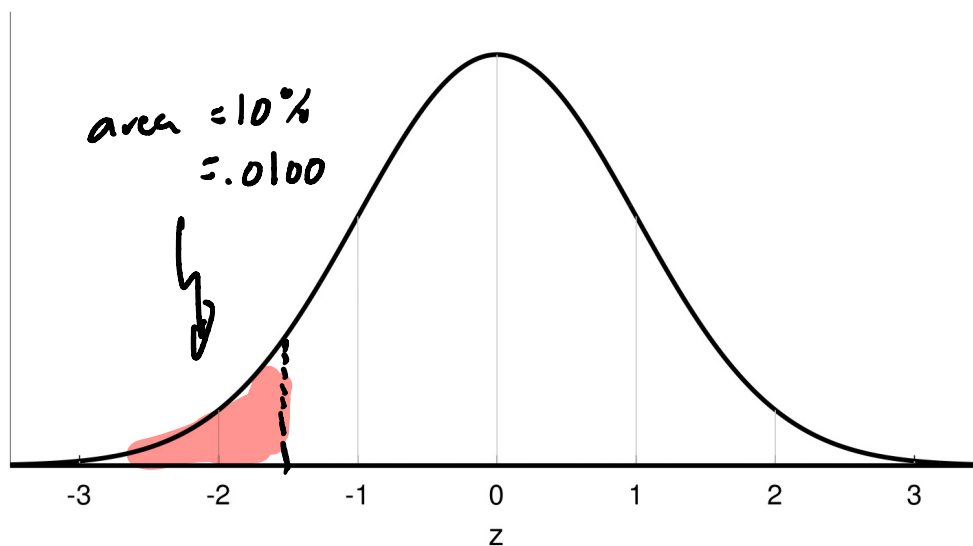
Example: Find the z score for which 5% of the area under the standard normal distribution lies above.



Example: Find the value of z for which 10% of the area under the standard normal distribution lies below:

10% of z scores fall above

$$z = 1.28$$



$$z = -1.28$$

Example: Find the values of z that bracket the middle 95% of the area under the standard normal distribution.

