

- ① $X =$ time it takes Ms. Arvelo to commute to school
 $Y =$ time it takes Ms. Arvelo to get ready

$$\mu_{y+x} = 41.6 + 47 = 88.6$$

$$\sigma_{y+x} = \sqrt{4.5^2 + 5.37^2} = 7.01$$



$$\sim N(88.6, 7.01)$$

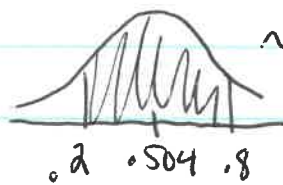
$$\text{Normalcdf}(\underbrace{-\infty}_{\text{lower}}, \underbrace{90}_{\text{upper}}, \underbrace{88.6}_{\text{mean}}, \underbrace{7.01}_{\text{sd}}) = .579$$

The prob. Ms Arvel will arrive at school within 90 minutes is .579

- ② $X =$ top of box
 $Y =$ bottom of box

$$\mu_{x-y} = 3.548 - 3.044 = .504$$

$$\sigma_{x-y} = \sqrt{.1896^2 + .1873^2} = .267$$

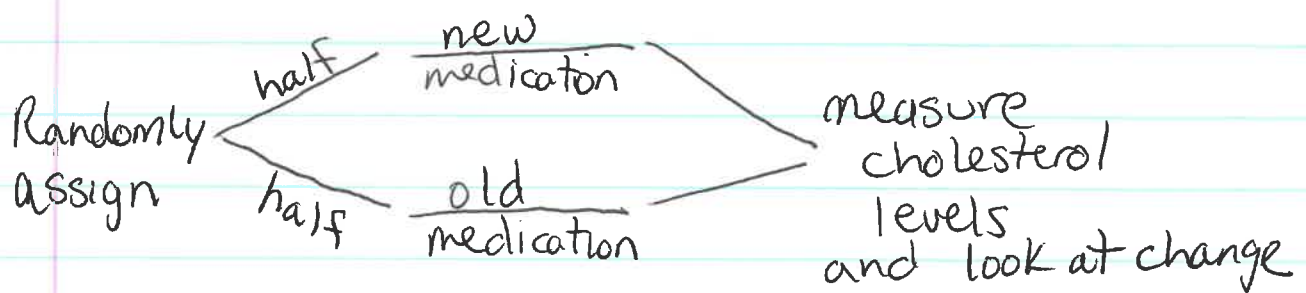


$$\sim N(.504, .267)$$

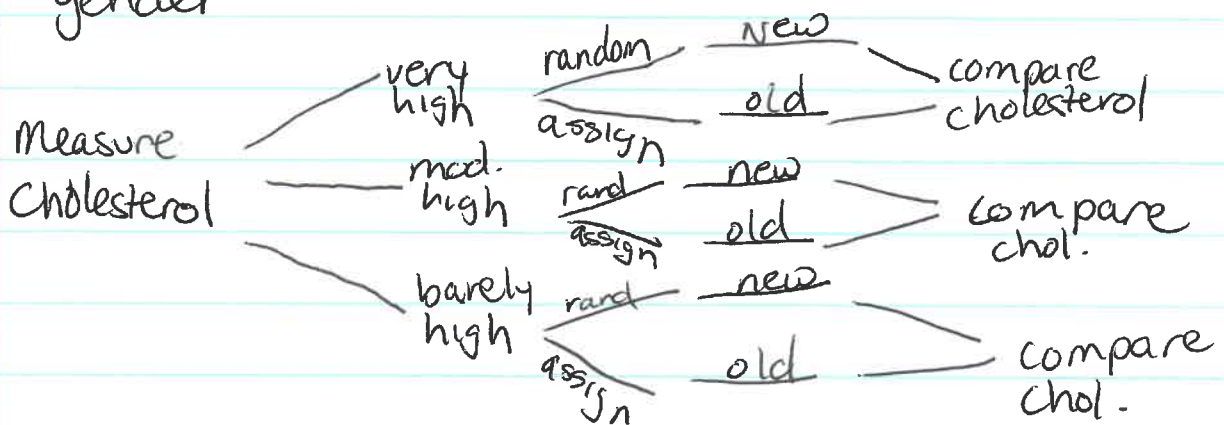
$$\text{Normalcdf}(\underbrace{.2}_{\text{lower}}, \underbrace{.8}_{\text{upper}}, \underbrace{.504}_{\text{mean}}, \underbrace{.267}_{\text{sd}}) = .7387$$

The prob. Ms. Mizzi will construct a top that fits the bottom is .7387

3. a) Volunteers will be assigned a number 1 to n. Using a random number generator, randomly select half of the volunteers (without replacement) these volunteers will get the new medication. The other half of volunteers will get the current medication. Measure everyone's cholesterol level at the start, have both treatment groups take medication for several months then remeasure cholesterol levels.



- b) You could block by levels of high cholesterol or block by activity level or block by gender



c.) Yes. Everyone in each block is randomly assigned a treatment. Volunteers do not know which medication they are receiving and administrators do not know which medication they are giving.

4.) a. Blocking scheme A

We expect the forest to have an effect on the growth of the trees in the fields nearby.

So, both the varieties should be by the forest and both away from the forest.

b.) By randomly assigning trees to plots, we are likely to get similar conditions for all the uncontrolled variables in the study (soil type, moisture level, sun level etc.) for both types of trees.