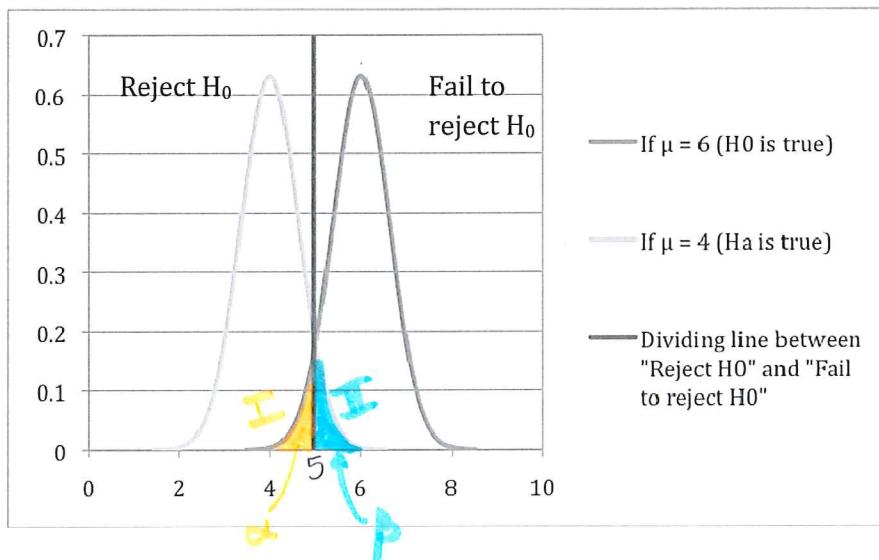


## Type I and Type II Error

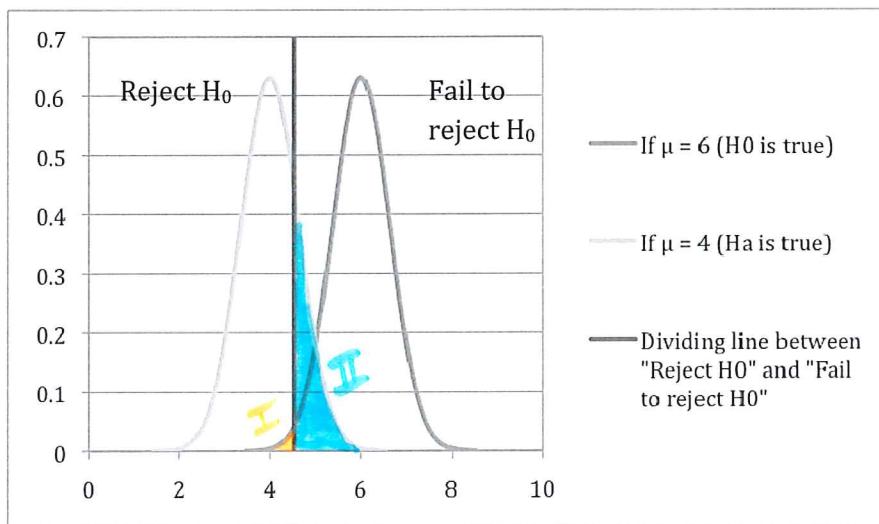
Change made: decrease the significance level  $\alpha$  from 0.05 to 0.01

- Shade the areas that correspond to type I error and type II error using different colors.

$$\alpha = 0.05$$



$$\alpha = 0.01$$

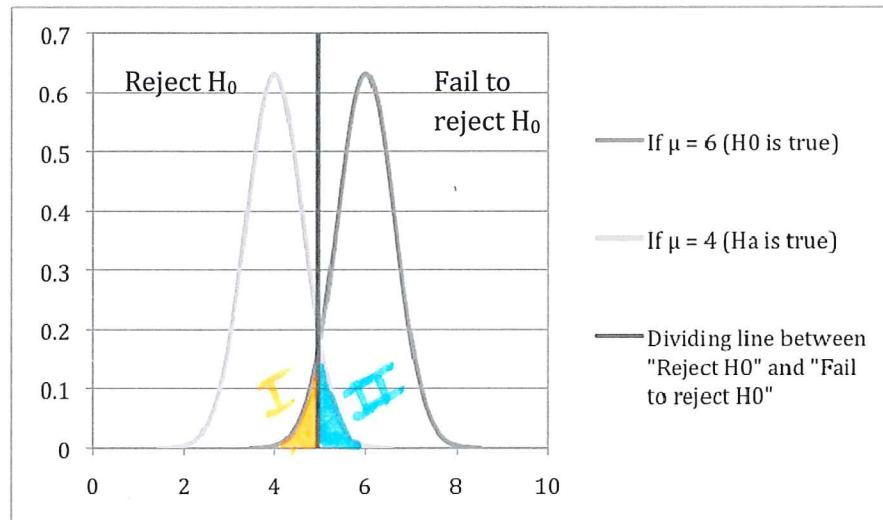


- What about the graph changed? *Type I ↓, Type II ↑,  $\alpha ↓$ , rejection line ←*
- Pros: *Type I error ↓*
- Negatives: *Type II error ↑*

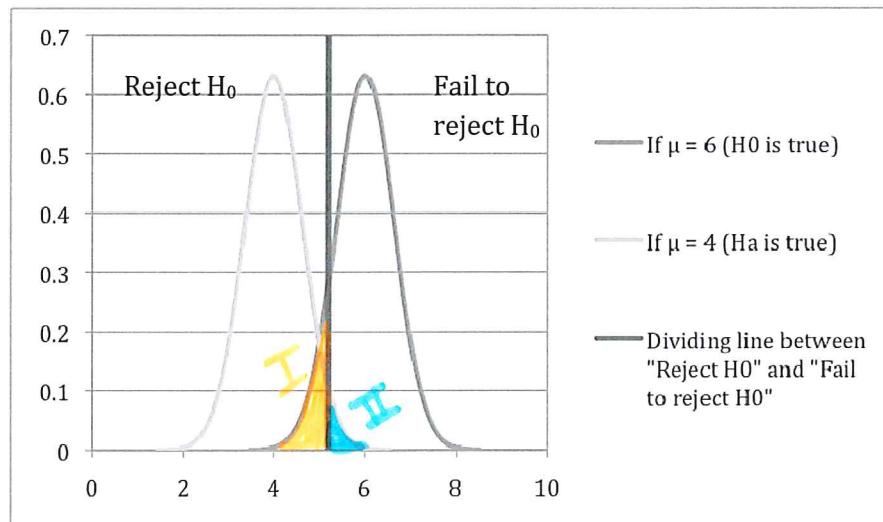
Change made: increase the significance level  $\alpha$  from 0.05 to 0.10

5. Shade the areas that correspond to type I error and type II error using different colors.

$$\alpha = 0.05$$



$$\alpha = 0.10$$



6. What about the graph changed? *Type I ↑, Type II ↓, α ↑, rejection →*

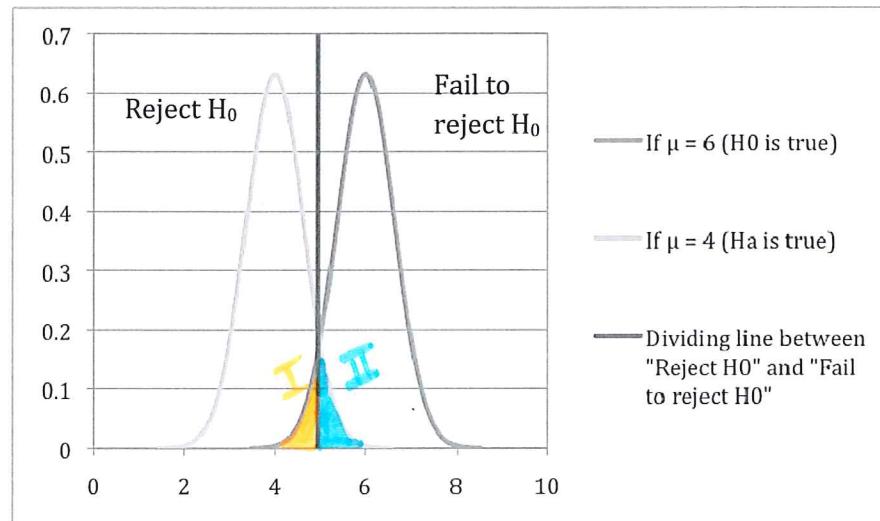
7. Pros: *Type II error ↓*

8. Negatives: *Type I error ↑*

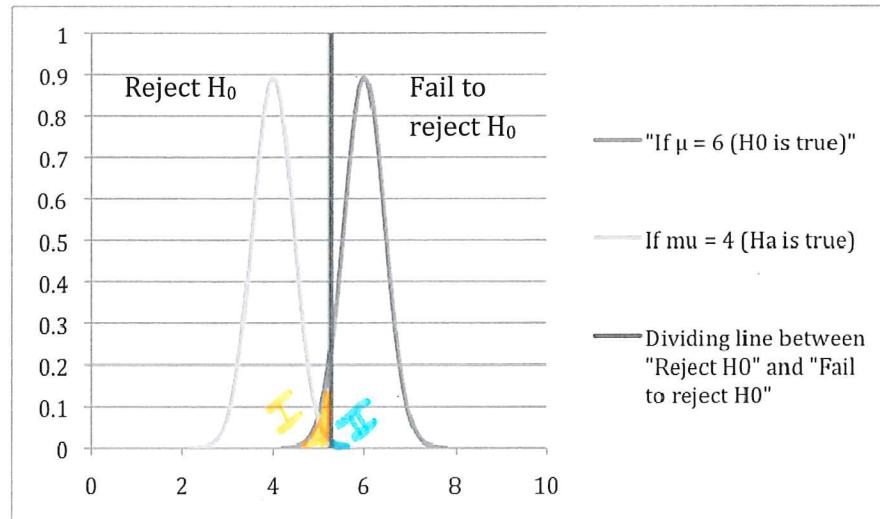
Change made: increase the sample size from  $n = 10$  to  $n = 20$

9. Shade the areas that correspond to type I error and type II error using different colors.

$n = 10$



$n = 20$



10. What about the graph changed? *Type II ↓, n ↑, rejection line →*

11. Pros: *Type II error ↓*

12. Negatives: *n ↑*

Summary:

13. How can we decrease the probability of a type I error?

Decrease  $\alpha$

(Increase  $n$  - Type I error stays the same)

14. How can we decrease the probability of a type II error?

Increase  $\alpha$

Increase  $n$