9.1 b

reality/truth

	H_0 true	H_0 false
reject H_0	Type I error $P(\text{Type I}) = \alpha$	correct conclusion Power $= 1 - \beta$ ← want this
fail to reject H_0	correct conclusion	Type II error $P(\text{Type II}) = \beta$

our conclusion

ex: BBall free throws

$H_0: P = 80\%$
$H_a: P < 80\%$

Type I: we conclude that he is not an 80% free throw shooter when he really is.
Consequence: he misses opportunities

Type II: Conclude that he is an 80% F.T. shooter when he really is not.
Consequence: he gets opportunities when he shouldn't.

ex: p.538

Power of the Test

the probability that we correctly reject H_0 at a chosen α, when a specific value of H_a is true.

$$\text{Power} = 1 - \beta$$

- Higher values of power are better
- Larger sample size = higher power
- Higher α = higher power
- Lower values of power means a higher chance of a Type II error