

Rocket Launcher

1. $P(\text{success in 1st 30}) = .85^{30}$ ← 30 trials

Summary... Multiplication rule for independent events (p. 328).

$$P(A \cap B) = P(A) \times P(B)$$

2. $P(\text{fails on 31st trial} \mid \text{first 30 successful}) =$
 $= 0.15$

* Each time you attempt to ignite, there is a .15 probability of failure. Just like flipping heads on a coin is .5

$$P(\text{fails on 32nd trial or 31st} \mid \text{first 30 successful}) =$$
$$= .15 + (.85)(.15) = .2775$$

3. Given that the first 30 super igniters successfully launch rockets, is it reasonable to believe that the failure rate of the super igniters is less than 15%? Explain.

probability of first 30 successful launches = $.85^{30} = .0076$. Since this probability is quite LOW, it is reasonable to believe that the failure rate is less than 15%.