

When a missile is fired from a ship, the probability that it is intercepted is  $\frac{1}{3}$ . The probability that the missile hits the target, given that it is not intercepted is  $\frac{3}{4}$ . If three missiles are fired independently from the ship, the probability that all three hits the target, is what?

Probability that missile isn't intercepted equals:

$$P(n i) = 1 - P(i)$$

$P(i)$  - probability that missile is intercepted

$$P(n i) = 1 - \frac{1}{3} = \frac{2}{3}$$

Probability that missile isn't intercepted AND missile hits the target equals:

$$P_1 = P(n i) * P(h)$$

$P(h)$  - probability the missile hits the target, given that it is not intercepted

$$P_1 = \frac{2}{3} * \frac{3}{4} = \frac{1}{2}$$

If three missiles are fired independently from the ship, the probability that all three hits the target equals:

$$P_3 = P_1^3 = \left(\frac{1}{2}\right)^3 = \frac{1}{8}$$

Answer: probability that all three hits the target equals  $\frac{1}{8}$