

4.6 Assume that 70 percent of crimes occur at night, and that 40 percent of the crimes at night and 20 percent of daytime crimes are violent. If the record of one crime is chosen at random from the police files on which these percentages are based, what is the probability that it is a violent crime?

$$\begin{aligned}
 P(\text{Violent}) &= P(\text{Violent And Night Or Violent And Day}) \\
 &= P(\text{Violent And Night}) + P(\text{Violent And Day}) \\
 &= P(\text{Violent}) * P(\text{Night}) + P(\text{Violent}) * P(\text{Day}) \\
 &= (.7) * (.4) + (.2) * (.3) \\
 &= .28 + .06 \\
 &= \boxed{0.34}
 \end{aligned}$$

Or make a chart of 100 crimes

	Violent	Non-Violent	Total
Night	28	42	70
Day	6	24	30
Total	34	66	100

STUDY: Chapter 3: Section 3.3, 3.4
 • Addition and Multiplication Rules for Probability