Question \#71924, Math / Statistics and Probability
The probability is 0.70 that a rare tropical disease will be diagnosed correctly. If it is diagnosed correctly, the probability is 0.90 that the patient will be cured and if it is not diagnosed correctly the probability is 0.40 that the patient will be cured. If a patient having this disease is cured, what is the probability that it was diagnosed correctly?

## Solution

Using conditional probability formula.
$P(B \mid A)=\frac{P(A \cap B)}{P(A)}$,
Where
event $\mathrm{A}=$ "patient cured";
event $\mathrm{B}=$ "disease diagnosed correctly".
$P(A \cap B)=0.7 \times 0.9=0.63 ;$
$P(A)=0.7 \times 0.9+0.3 \times 0.4=0.75 ;$
$P(B \mid A)=\frac{0.63}{0.75}=0.84$
Answer: if a patient has the disease cured, the probability that it was diagnosed correctly is 0.84 .

