

### Answer on Question #43572 – Math - Statistics and Probability

The effect on an antidepressant drug varies from person to person. Suppose that the drug is effective on 80% of women and 65% of man. It is known that 66% of the people who take the drug are women.

- i) What is the probability that the drug is effective?  
ii) Suppose that you are told that the drug is effective. What is the probability that the drug taker is a man..?

#### Solution

- i) The probability that the drug is effective

$$P(\text{effective}) = \frac{N_{\text{man}}}{N} \cdot P(\text{man effective}) + \frac{N_{\text{women}}}{N} \cdot P(\text{women effective}).$$
$$P(\text{effective}) = 0.34 \cdot 0.65 + 0.66 \cdot 0.8 = 0.749.$$

- ii) The probability that the drug taker is a man

$$P(\text{drug taker is a man}) = P(\text{effective}) \cdot \frac{N_{\text{man}}}{N} = 0.749 \cdot 0.34 = 0.25466.$$

**Answer: i) 0.749; ii) 0.25466.**