

$$\begin{aligned}
 P(Y=Yes|X=4) &= \frac{P(X=4, Y=Yes)}{P(X=4)} = \frac{P(X=4|Y=Yes) \cdot P(Y=Yes)}{P(X=4|Y=Yes) \cdot P(Y=Yes) + P(X=4|Y=No) \cdot P(Y=No)} \\
 &= \frac{N(10,6) \times 0.8}{N(10,6) \times 0.8 + N(0,6) \times 0.2} \\
 &= 0.752
 \end{aligned}$$

$$P(X_1=x_1, X_2=x_2, X_3=x_3, y=1) = P(X_1=x_1, X_2=x_2, X_3=x_3|y=1) P(y=1)$$

=

$$\begin{array}{cc}
 X_1 \rightarrow X_2 & X_1 \rightarrow X_2 \\
 \searrow & \downarrow \\
 & X_3
 \end{array}$$