$$P(Y=Yes \mid X=4) = \frac{P(X=4, Y=Yes)}{P(X=4)} = \frac{P(X=4 \mid Y=Yes) \cdot P(Y=Yes)}{P(X=4 \mid Y=Yes) \cdot P(Y=Yes) + P(X=4 \mid Y=No) \cdot P(Y=No)}$$

$$= \frac{N(10,6) \times 0.8}{N(10,6) \times 0.8 + N(0,6) \times 0.2}$$

$$= 0.752$$

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

$$=$$

$X_1 \to X_2$ $\quad$ $X_1 \to X_2$

$\searrow X_3$