3.

$$P(H|M) = \frac{1}{\sqrt{2\pi\sigma^2_{H|M}}} \exp\left(1 - \frac{(68-\mu_{H|M})^2}{2\sigma^2_{H|M}}\right)$$

$$= \frac{1}{\sqrt{2\pi \times 17.1875}} \exp\left(1 - \frac{(68-69.75)^2}{2\times 17.1875}\right)$$

$$= 0.23928$$

$$P(S|M) = \frac{1}{\sqrt{2\pi \times 1.171875}} \exp\left(1 - \frac{(9.5-10.625)^2}{2\times 1.171875}\right) = 0.58377$$

$$P(H|F) = \frac{1}{\sqrt{2\pi \times 7.44}} \exp\left(1 - \frac{(68-65.6)^2}{2\times 7.44}\right) = 0.26996$$

$$P(S|F) = \frac{1}{\sqrt{2\pi \times 0.74}} \exp\left(1 - \frac{(9.5-7.6)^2}{2\times 0.74}\right) = 0.10997$$

4. $p(\bar{x}|M) = p(H|M) \cdot p(S|M) = 0.13968$

$p(M) = \frac{4}{9}$

$p(M|\bar{x}) \propto p(\bar{x}|M)p(M) = 0.06208$

$P(\bar{x}|F) = p(H|F) \cdot P(S|F) = 0.02969$

$P(F) = \frac{5}{9}$

$P(F|\bar{x}) \propto 0.01649$

$P(M|\bar{x}) > P(F|\bar{x}) \rightarrow$ male