All women

In measuring, we find:

Women with cancer
p(cancer) = 1%

Women with-
out cancer
p($\sim$cancer) = 99%

Now we pass both groups through
the sieve; note that both sieves are
the same; they just behave differently
depending on which group is passing
through.
Let test+ = a positve mammography.

p(test+ | cancer) = 0.8

p(test+ | $\sim$cancer) = 0.096

$1\% * 80\%$

$99\% * 9.6\%$

+

Finally, to find the probability that a
positive test *actually means cancer*, we
look at those who passed through the
sieve *with cancer*, and divide by all who
received a positive test, cancer or not.

$$\frac{\text{p(test+ | cancer)}}{\text{p(test+ | cancer)} + \text{p(test+ | }\sim\text{cancer)}} =$$

$$\frac{1\% * 80\%}{(1\% * 80\%) + (99\% * 9.6\%)} = 7.8\% = \text{p(cancer | test+)}$$