

No. Problem statement

Set E

1 Probabilities of being diagnosed with cancer and having cancer.

$$P(\text{Ca}) = 0.11$$

$$P(D|\text{Ca}) = 0.79$$

$$P(D|\text{Ca}') = 0.10$$

a) What is $P(D)$? Use total probability.

b) What is the probability that a person diagnosed as having Ca actually has Ca?

2 Four Inspectors stamp dates on film. Their proportions of all dates stamped (S) and their rates of errors for each for 200 they personally stamped are shown below:

Name	S	D'
John	15%	3
Tom	55%	2
Jeff	11%	4
Pat	19%	1
	100%	

a) What is the probability that a given stamp will dated incorrectly?

1.1%

b) If it is date incorrectly, what is the probability that John stamped it?

20.6%

5 The probability that a patient recovers from a disease is 63%. What is the probability that:

a) 2 out of 3 patients in a group with the disease will survive? 44.1%

b) Probability that all 3 survive? 25.0%

6 There are 3 consulting firms that have the following probabilities of cost overruns:

Company	<u>P(C)</u>	<u>P(Overrun)</u>
A	36%	5%
B	20%	4%
C	27%	8%

a) If you use the firms at the proportions listed under 'P(C)', what is the probability that you will be charged an overrun? 4.8%

b) What is the probability that if you had an overrun it was due to Company C? 45.4%

c) What is the probability that if you had an overrun it was due to Company A? 37.8%

7 Construction has 2 sales engineers. Sometimes they make errors:

<u>Engineer</u>	<u>P(Eng)</u>	<u>P(error)</u>
E1	45%	3%
E2	55%	6%

a) What is the probability that one or the other will make an error?

4.7%

b) If there is a serious error, which engineer is most likely to have made it?