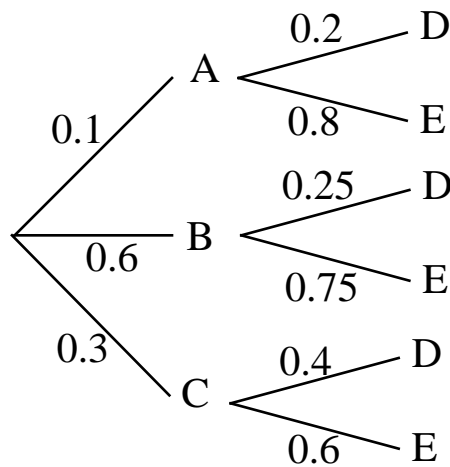


Show all work

	A	B	C	Total
D	20	25	15	60
D	30	55	5	90
Total	50	80	20	150

1. Calculate each probability using the table above. If necessary, round answers to three significant digits. (5 pts each)

- a) $P(A)$
- b) $P(B \cap D)$
- c) $P(C|D)$
- d) $P(D|A)$



2. Calculate each probability using the probability tree above. If necessary, round answers to three significant digits. (5 pts each)

- a) $P(E)$
- b) $P(D|B)$
- c) $P(C \cap E)$
- d) $P(A|E)$

x	1	2	3	4	5
p(x)	0.1	0.15	0.3	0.25	0.2

3. Use the probability distribution above to answer each question.

- a) (7 pts) Find the probability that x is at least 4.
- b) (8 pts) Find the expected value of x.

4. Rob has a deck of 50 cards, numbered 1 through 50 with the following colors:

Red	1, 2, 3, 4, 5, 6, 7, 8, 9, 10
Blue	11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25
Green	26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40
Yellow	41, 42, 43, 44, 45, 46, 47, 48, 49, 50

If necessary, round answers to three significant digits.

- a) (10 pts) If you are dealt five cards from the deck, what is the probability of getting 3 red cards and 2 blue cards?
- b) (10 pts) If you are dealt five cards from the original deck, what is the probability that at least one card is yellow?
- c) (8 pts) If you pick one card from the original deck, what is the probability that it is divisible by 4, given that it's red?

5. (10 pts) Rob has three boxes - one red, one blue, and one white. Each box has green and yellow marbles in it, as listed:

<u>Red Box</u>	<u>Blue Box</u>	<u>White Box</u>
7 green	3 green	10 green
1 yellow	5 yellow	6 yellow

You randomly pick a box and then pick a marble from that box. If you picked a yellow marble, what is the probability that you picked the blue box? Write your answer as a reduced fraction.

6. (10 pts) Rob is running a gambling game that works as follows:

You pay \$5 to play.

You then roll two fair dice (each numbered 1 through 6).

If the two numbers rolled are the same, Rob gives you \$30.

Otherwise, you get nothing.

Is Rob's game fair? Justify your answer using expected values.