1a A customer is going to buy a new Blu-ray player, a new receiver, and a new speaker system. The choices of Blu-ray player are: LG, Toshiba, Sony, Insignia; the receiver choices are: Yamaha (Y), Onkyo (O), Pioneer (P); the speaker system choices are: Bose (B), JBL (J). What's the number of sample points in the sample space? (4)(3)(2)=24.

1b Make a tree diagram that illustrates the sample space.


1c Find the probability of selecting a Sony player. $\frac{6}{24}=\frac{1}{4}$
1d Find the probability of not selecting Bose speakers, but selecting an Onkyo receiver. $\frac{4}{24}=\frac{1}{6}$

2a One card is randomly selected from a standard 52-card deck. Find the probability of getting an ace. $\frac{4}{52}=\frac{1}{13}$

2b One card is randomly selected from a standard 52-card deck. Find the probability of getting a red card or a card less than 5 (note an ace has rank 1). $\frac{26}{52}+\frac{16}{52}-\frac{8}{52}=\frac{34}{52}=\frac{17}{26}$

3 A sample of lightbulbs is inspected, and some bulbs are found to be good while others were found to be bad. Results are as follows:

| WATtAGE | GOOD | BAD | Total |
| :--- | :---: | :---: | ---: |
| 20 | 80 | 15 | 95 |
| 50 | 100 | 5 | 105 |
| 100 | 120 | 10 | 130 |
| Total | 300 | 30 | 330 |

If one of the bulbs is chosen at random, find the probability that...
(a) The bulb is bad, given that it is $20 \mathrm{~W} \cdot \frac{15}{95}=\frac{3}{19}$
(b) The bulb is 100 W , given that it is good. $\frac{120}{300}=\frac{2}{5}$
(c) The bulb is good, given that it is not $50 \mathrm{~W} \cdot \frac{80+120}{95+130}=\frac{200}{225}=\frac{8}{9}$

