Use this table of data to answer questions 1 - 5.

Class	Male	Female
Freshmen	20	37
Sophomore	42	12
Junior	35	34
Senior	22	17

1. If you choose a student at random, what is the probability of choosing a junior who is male? 35

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2. What is the probability of choosing a female given she is a senior?

$$\frac{17}{39} = .4359$$

3. What is the probability of choosing a female or a sophomore?

$$\frac{142}{219} = .6484$$

4. What is the probability of choosing a male student?

$$\frac{119}{219} = .5434$$

5. Are the events "choose a male" and "choose a junior" *independent*? How do you know?

$$P(male) = .5434$$
  $P(male | jr) = \frac{35}{69} = .5072$ 

## No, these events are not independent.

- 6. If A∪B = S (sample space), P(A and B<sup>c</sup>) = 0.25, and P(A<sup>c</sup>) = 0.35, then P(B) =
   (a) 0.35
  - (b) 0.4
  - 0.65
  - (d) **)**.75

(c) None of the above. The answer is \_\_\_\_\_.

- 7. Event A occurs with probability 0.2. Event B occurs with probability 0.8. If A and B are disjoint (mutually exclusive), then
  - (a) P(A and B) = 0.16.
  - (b) P(A or B) = 1.0.
  - (c) P(A and B) = 1.0.
  - (d) P(A or B) = 0.16.
  - (e) Both A and B are true.

- 8. Consider the following events:
  - V: the letter chosen is a vowel.
  - F: the letter chosen falls in the first half of the alphabet
  - (i.e., between A and M).

List the outcomes in each of the following events, and determine their probabilities:

$$V = \{A, E, I, o, v\}$$

$$P(V) = \frac{5}{2.6} = .1973$$

$$F = \{A, B, c, b, E, F, G, H, I, J, K, L, M\}$$

$$P(F) = \frac{1}{2} = .5$$

$$V \text{ or } F = \{A, B, c, b, E, F, G, H, I, J, K, L, M, o, v\}$$

$$P(V \text{ or } F) = \frac{15}{2.6} = .5769$$

$$Complement \text{ of } F = \{N, o, P, q, P, S, T, v, v, P(F^c) = \frac{1}{2} = .5$$

$$W, K, V, Z \}$$

9. May has applied to both Harvard and the University of Florida. She thinks the probability that Harvard will admit her is 0.4, the probability that Florida will admit her is 0.5, and the probability that both will admit her is 0.2.

(a) Make a Venn diagram with the probabilities given marked.



(b) What is the probability that neither university admits May?

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(c) What is the probability that she gets into Florida but not Harvard?

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(d) What is the probability that she gets into Florida given she got into Harvard?

(e) Are the events in (d) independent? P(florida | Harvard) = .5 P(florida) = .5 Yes!