

*Directions:*

- **Examples** are demonstrated by TA. You should watch the TA working through the problem and takes notes.
- **Exercises** are for you to work on with/without the help of TA. You will be graded on your work for the exercises. Always show your work!
- Each part is worth 1 point. There are 10 parts in total.

**Example 1:**

If  $P(A) = 0.4$ ,  $P(B) = 0.5$ , and  $P(A \cap B) = 0.3$ , find ...

- a)  $P(A \cup B)$ ;                      b)  $P(A \cap B')$ ;                      c)  $P(A' \cup B')$ .

**Exercise 1:**

Suppose that  $P(A) = 0.40$ ,  $P(B) = 0.35$ ,  $P(A \cup B) = 0.70$ . Find ...

- a)  $P(A \cap B)$ ;                      b)  $P(A' \cup B')$ .

**Example 2:**

Find the value of  $p$  that would make this a valid probability model.

- a) Suppose  $S = \{0, 2, 4, 6, 8, \dots\}$  (even non-negative integers) and  
$$P(0) = p, \quad P(k) = \frac{1}{3^k}, \quad k = 2, 4, 6, 8, \dots$$

b) Suppose  $S = \{1, 2, 3, 4, \dots\}$  (positive integers) and

$$P(1) = p, \quad P(k) = \frac{(\ln 3)^k}{k!}, \quad k = 2, 3, 4, \dots$$

**Exercise 2:**

Suppose  $S = \{1, 2, 3, 4, 5, 6, \dots\}$  and  $P(k) = \frac{c \cdot 3^k}{k!}$ ,  $k = 1, 2, 3, 4, 5, 6, \dots$

a) Find the value of  $c$  that makes this a valid probability distribution.

b) Find  $P(\text{outcome is greater than or equal to } 5)$ .



