

## MATH 311 – REVIEW EXAM 1

### 27.2

Conditions necessary for probability – uncertainty and repeatability  
Outcome, event, sample space

### 27.3

Experimental (empirical) probability

Theoretical probability

Probability can take on values between 0 and 1 inclusive

All probabilities must sum to 1 for a sample space

Finding probability using experimental or theoretical methods – similarity & difference

Simple theoretical probability: spinner, die, coin

**$P(\text{not } A) = 1 - P(A)$**

### 28.1

Listing sample space for multiple events using a systematic method

Listing sample space for multiple events using a tree diagram

Determining if outcomes are equally likely

Finding the total number of outcomes for a sample space

Listing sample space and finding probabilities when outcomes are not equally likely –  
by multiplying probabilities along the branches using a tree diagram

## REVIEW PROBLEMS FOR EXAM 1

1. For the draw of one ball from the bag shown, find:

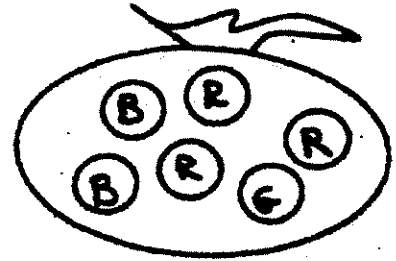
$$P(B) =$$

$$P(\text{not } R) =$$

$$P(G) =$$

$$P(B \text{ or } G) =$$

$$P(B \text{ and } G) =$$



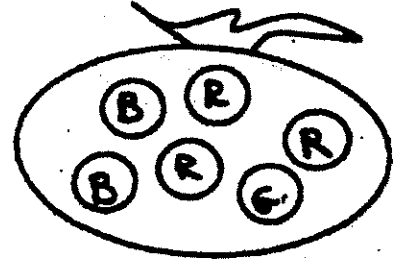
2. Suppose that an experiment involved drawing a ball from the bag above and tossing a coin.
- List the sample space:
  - Are the outcomes you listed for your sample space all equally likely? Explain.
3. Suppose that our new experiment is to draw 2 balls from the bag above, **WITHOUT** replacing the ball between the two draws. Draw a tree diagram for this situation as compactly as possible. Include the sample space and probabilities.

Find  $P(\text{at least one } B) =$  \_\_\_\_\_

# REVIEW PROBLEMS FOR EXAM 1

1. For the draw of one ball from the bag shown, find:

$$\begin{aligned}
 P(B) &= 2/6 & P(\text{not } R) &= 3/6 \\
 P(G) &= 1/6 & P(B \text{ or } G) &= 3/6 \\
 P(B \text{ and } G) &= 0
 \end{aligned}$$



2. Suppose that an experiment involved drawing a ball from the bag above and tossing a coin.

a. List the sample space:

① BH, BT, RH, RT  
GH, GT

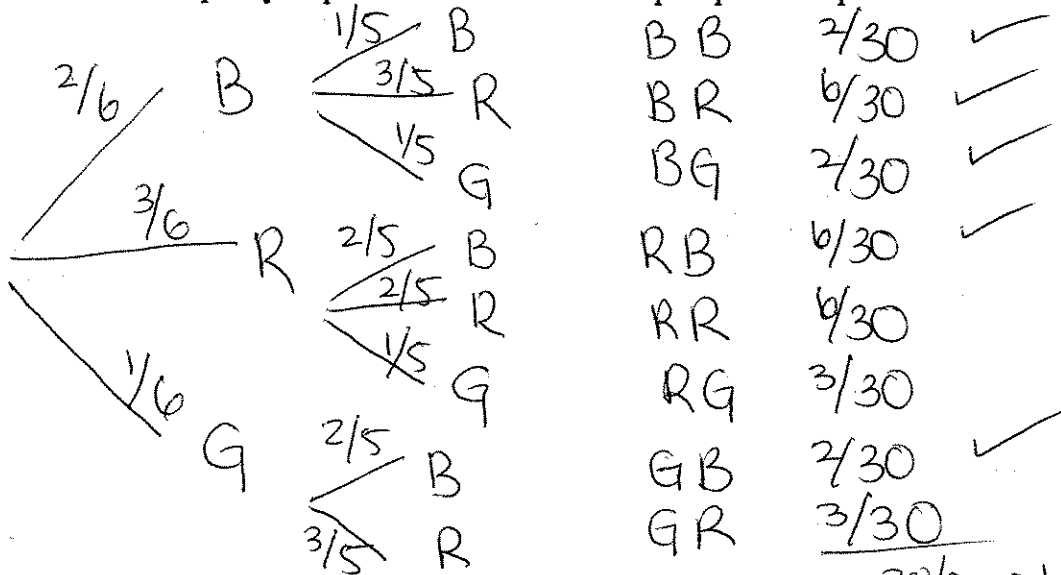
②  $B_1H, B_1T, B_2H, B_2T, R_1H, R_1T, R_2H, R_2T, R_3H, R_3T, GH, GT$

b. Are the outcomes you listed for your sample space all equally likely? Explain.

① Not all equally likely because there are not the same number of each color ball.

② yes all equally likely - all balls accounted for

3. Suppose that our new experiment is to draw 2 balls from the bag above, WITHOUT replacing the ball between the two draws. Draw a tree diagram for this situation as compactly as possible. Include the sample space and probabilities.



Find  $P(\text{at least one } B) = \underline{18/30}$