

# Math 153 - Quiz 6

March 7, 2019

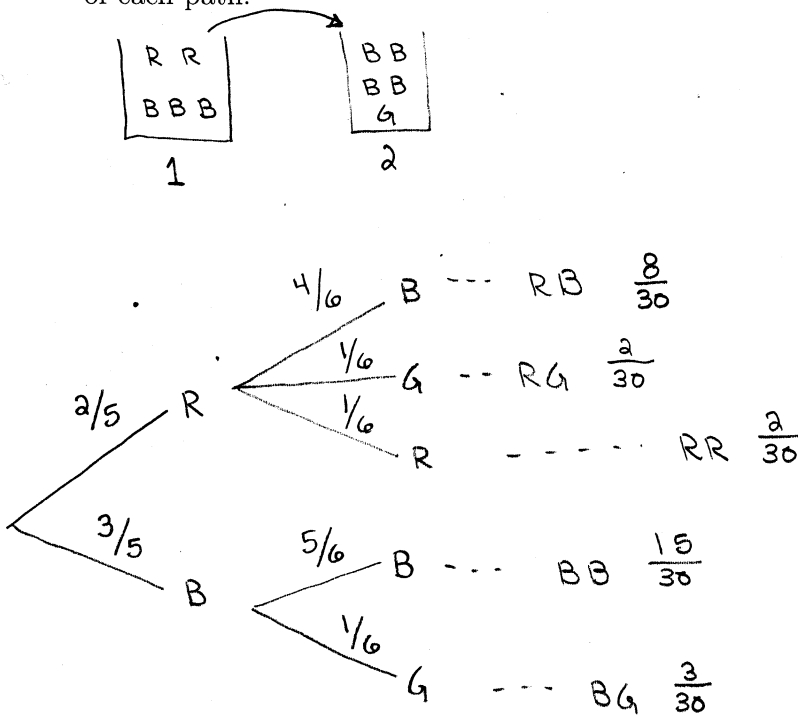
Name key

Score \_\_\_\_\_

Show all work to receive full credit. Supply explanations when necessary.

1. (5 points) Jar 1 contains 2 red marbles and 3 blue marbles. Jar 2 contains 4 blue marbles and 1 green marble. A marble is selected from Jar 1 and placed into Jar 2. Then a marble is selected from Jar 2.

- (a) Sketch the complete tree diagram for this experiment. Include the probabilities of each path.



- (b) What is the probability of selecting a blue marble from Jar 2?

$\{RB, BB\}$

$$\frac{8}{30} + \frac{15}{30} = \frac{23}{30}$$

2. (2 points) If the odds against the event  $Z$  are  $18:7$ , what is the probability of  $Z$ ?

ODDS IN FAVOR ARE  $\frac{7}{18}$

$$\Rightarrow \text{Prob is } \frac{7}{18+7} = \boxed{\frac{7}{25}}$$

3. (3 points) A letter is selected at random from the word *racecars*. Let  $A$  be the event of selecting a vowel, and let  $B$  be the event of selecting the letter  $e$ .

(a) Determine  $P(B|A)$ .

Prob of choosing  $e$  from  $a, e, a$

$$= \boxed{\frac{1}{3}} = \frac{P(A \cap B)}{P(A)}$$

(b) Determine  $P(A|B)$ .

Prob of choosing  $a$  or  $e$  from  $e$

$$= \boxed{1} = \frac{P(A \cap B)}{P(B)}$$

(c) Are  $A$  and  $B$  independent? Show work to justify your answer.

$$P(B|A) = \frac{1}{3} \neq P(B) = \frac{1}{8}$$

$A$  AND  $B$  ARE NOT INDEPENDENT.