© Scarborough Spring 2008 Math 141 Quiz 6 KEY

(30pts) NAME (printed neatly): _____

(10pts) Section Number (circle correct section): 521(9:10am) 522 (10:20am) 514 (11:30am) 525(1:50pm)

Quiz Grade: _____

There are 4 different green balls, 5 different purple balls, 2 identical yellow balls, and 3 different red balls.

a. (15pts) If just the green, purple and red balls (no yellow balls) are lined up at random, what is the probability of getting all the balls of the same color next to each other?

$$\frac{3!4!5!3!}{12!}$$

$\frac{103680}{479001600}$ _____ Give as an exact fraction, as a ratio of integers with no reducing.

0.00021645 _____ Give as a decimal to 8 decimal places.

b. (15pts) If 3 balls are selected at random from the 14 balls, what is the exact probability of getting 1 green, 1 purple and 1 red ball?

1G1P1R

$$\frac{4\cdot 5\cdot 3}{C(14,3)} = \frac{60}{364} = \frac{15}{91}$$

c. (15pts) If 3 balls are selected at random from the 14 balls, what is the exact probability, as a fraction in simplest terms, of getting at least 2 purple balls?

$$\frac{\overset{2P}{C(5,2)}\cdot\overset{1P^C}{C(9,1)} + \overset{3P}{C(5,3)}}{C(14,3)} = \frac{10\cdot 9+10}{364} = \frac{100}{364} = \frac{25}{91}$$

d. (15pts) If 3 balls are selected at random from the 14 balls, what is the exact probability, as a fraction in simplest terms, of getting at least 2 green balls or exactly 1 red ball?

$$\frac{\overset{2G}{C(4,2)}\cdot\overset{1G^C}{C(10,1)} + \overset{3G}{C(4,3)} + \overset{1R}{C(3,1)}\cdot\overset{2R^C}{C(11,2)} - \overset{2G}{C(4,2)}\cdot\overset{1R}{C(3,1)}}{C(14,3)} = \frac{6\cdot 10+4+3\cdot 55-6\cdot 3}{364} = \frac{211}{364}$$