Name: **KEY**

Date: _____ Period: _____

Find each probability.

1. In cooking class, students are randomly choosing 1 of 3
   different recipes. Two students choose the same recipe.

   $P(\text{same recipe}) \cdot P(\text{same recipe}) = 1/3 \cdot 1/3$

   _____1/9_____

2. Steven rolled a 1–6 number cube four times. The result was
   4 odd numbers. $P(\text{odd}) \cdot P(\text{odd}) \cdot P(\text{odd}) \cdot P(\text{odd}) =$
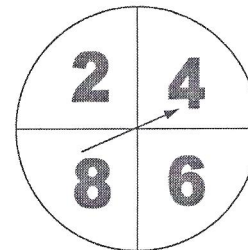
   _____1/16_____

   $3/6 \cdot 3/6 \cdot 3/6 \cdot 3/6$

The spinner shown here is spun twice.

3. The sum of the results is equal to or greater than 10 and
   the first spin lands on 4.

   a. Explain why the events are dependent.

   Because $P(\text{sum} \geq 10)$ is different
   when it's known that the
   first spin is a 4.

   b. Find the probability. $P(4) \cdot P(\text{sum} \geq 10 | 4)$ _____1/8_____

   $1/4 \cdot 2/4 = 2/16$

4. The first spin lands on 6 and the sum of the results is less than or equal to 10.

   a. Explain why the events are dependent. Because $P(6)$ is different
   when it's know that the sum of both
   spins is less than or equal to 10.

   b. Find the probability. $P(6) \cdot P(\text{sum} \leq 10 | 6)$ _____1/8_____

   $1/4 \cdot 2/4 = 2/16$

The table shows the population distribution in Ireland in 1996 by age and gender.

Ireland's Population in 1996					
Age Group	0–20	21–40	41–60	61–80	Over 80
Males (in thousands)	620.4	526.8	405.3	212.0	33.0
Females (in thousands)	588.3	527.6	400.8	246.3	60.3

Find each probability.

5. A randomly selected person is no more than 20
   years old, given that the person is male.

   $P(\leq 20 | \text{male}) = \dfrac{620.4 \ (\leq 20)}{1797.5 \ (\text{male})} = 0.345$

6. A randomly selected person is female, given that
   the person is over 80 years old.

   $P(\text{female} | > 80)$

   $= \dfrac{60.3 \ (\text{female})}{93.3 \ (>80)} = 0.646$

A bag contains 3 red marbles, 7 yellow marbles, 5 green marbles, and 2 blue marbles.
Determine whether the events are independent or dependent, and find each probability.

7. A red marble is chosen at random and replaced, Independent
   and then the SAME red marble is chosen at
   random again. $P(\text{red}) \cdot P(\text{same red})$

   $3/17 \cdot 1/17 = 3/289$

8. A yellow marble and then a blue marble are
   chosen at random without replacement. Dependent $= 7/17 \cdot 2/16 = 7/136$

   $P(\text{Yellow}) \cdot P(\text{blue} | \text{Yellow not replaced})$

9. The table shows the results of a customer satisfaction survey of 100 randomly selected shoppers at the mall who were asked if they would shop at an earlier time if the mall opened earlier. Make a table of joint and marginal relative frequencies.

	Ages 10–20	Ages 21–45	Ages 46–65	65 and Older
Yes	13	2	8	24
No	25	10	15	3

	Ages 10–20	Ages 21–45	Ages 46–65	65 and Older	Total
Yes	.13	.02	.08	.24	.47
No	.25	.10	.15	.03	.53
Total	.38	.12	.23	.27	1

10. Jerrod collected data on 100 randomly selected students, and summarized the results in a table.

Owns an MP3 Player

		Yes	No
Owns a Smart phone	Yes	28	12
	No	34	26

a. Make a table of the joint relative frequencies and marginal relative frequencies. Round to the nearest hundredth where appropriate.

Owns an MP3 player

		Yes	No	Total
Owns a Smart Phone	Yes	.28	.12	.40
	No	.34	.26	.60
	Total	.62	.38	1

b. If you are <u>given</u> that a student owns an MP3 player, what is the probability that the student also owns a smart phone? Round your answer to the nearest hundredth.

$$P(\text{smart phone} \mid \text{MP3 player}) = \frac{.28 \ (\text{smart phone})}{.62 \ (\text{MP3})} = .452$$

c. If you are <u>given</u> that a student owns a smart phone, what is the probability that the student also owns an MP3 player? Round your answer to the nearest hundredth.

$$P(\text{MP3 player} \mid \text{smart phone}) = \frac{.28 \ (\text{MP3})}{.40 \ (\text{smart phone})} = .70$$