Algebra 2/Trig

Name: _____ Code: _____

7.1-7.4 Quiz Review

Date: _____ Period: _____

2. Jamie purchased 3 blouses, 3 jackets, and 2 skirts. How many different outfits using a blouse, a jacket, and a skirt are possible?

3. An Internet code consists of one digit followed by one letter. The number zero and the letter *O* are excluded. How many codes are possible?

6. Members from 6 different school organizations decorated floats for the homecoming parade. How many different ways can first, second, and third prize be awarded?

7. A teacher wants to send 4 students to the library each day. There are 21 students in the class. How many ways can he choose 4 students to go to the library on the first day?

12. How many identification codes are possible by using 3 letters if no letter may be repeated?

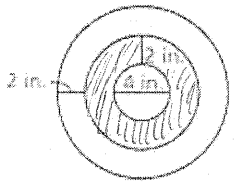
31. **Critical Thinking** Why are there more unique permutations of the letters in YOUNG than in GEESE?

A quarter, a nickel, and a penny are flipped. Find the probability of each of the following.

5. All three coins land the same way.

8. A clerk has 4 different letters that need to go in 4 different envelopes. What is the probability that all 4 letters are placed in the correct envelopes?

Use the diagram for Exercises 10 and 11. Find each probability.



10. that a point chosen at random is in the shaded area

11. that a point chosen at random is in the smallest circle

Use the table for Exercises 12 and 13.

12. Find the experimental probability of spinning red.

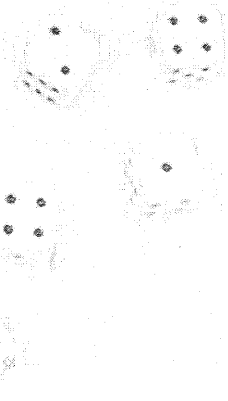
13. Find the experimental probability of spinning red or blue.

Spinner Experiment

Color	Red	Green	Blue
Spins	5	8	7

18. **Books** There are 7 books numbered 1–7 on the summer reading list. Peter randomly chooses 2 books. What is the probability that Peter chooses books numbered 1 and 2?

26. While playing Yahtzee and rolling 5 dice, Mel gets the result shown at right. Mel decides to keep the three 4's and reroll the other 2 dice.



a. What is the probability that Mel will have 5 of a kind?

b. What is the probability that she will have 4 of a kind (four 4's plus something else)?

c. What is the probability that she will have exactly three 4's?

38. How many outcomes are in the sample space when a quarter, a dime, and a nickel are tossed?

(A) 3 (B) 6 (C) 8 (D) 12

39. Two number cubes are rolled. What is the theoretical probability that the sum is 5?

(F) $\frac{1}{3}$ (G) $\frac{1}{6}$ (H) $\frac{1}{9}$ (J) $\frac{1}{12}$

Two number cubes are rolled—one blue and one yellow. Explain why the events are dependent. Then find the indicated probability.

4. The blue cube shows a 4 and the product is less than 20.

5. The yellow cube shows a multiple of 3, given that the product is 6.

14. The table shows immigration to the United States from three countries in three different years. A person is randomly selected. Find each probability.

a. that a selected person is from Cuba, given that the person immigrated in 1990

b. that a person came from Spain and immigrated in 2000

c. that a selected person immigrated in 1995, given that the person was from Ghana.

Immigration to the United States

Country	1990	1995	2000
Cuba	10,645	17,937	20,831
Ghana	4,466	3,152	4,344
Spain	1,886	1,321	1,264

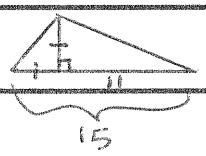
A bag contains number slips numbered 1 to 9. Determine whether the events are independent or dependent, and find the indicated probability.

17. selecting 2 even numbers when 2 slips are chosen without replacement

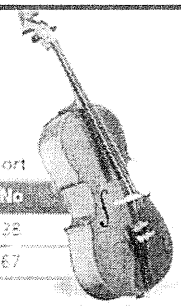
18. selecting 2 even numbers when 2 slips are chosen with replacement

1. A security code consists of 5 digits (0–9), and a digit may not be used more than once. How many possible security codes are there?

6. Find the probability that a point chosen at random inside the figure shown is in the shaded area.



5. **School** Pamela has collected data on the number of students in the sophomore class who play a sport or play a musical instrument.



		Plays a sport: Yes	Plays a sport: No
Plays an instrument	Yes	47	38
Plays an instrument	No	51	87

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

b. If you are given that a student plays an instrument, what is the probability that the student also plays a sport? Round your answer to the nearest hundredth.

c. If you are given that a student plays a sport, what is the probability that the student also plays an instrument? Round your answer to the nearest hundredth.

		Play Sport: Yes	Play Sport: No	Total
Play instrument	Yes			
Play instrument	No			
	Total			

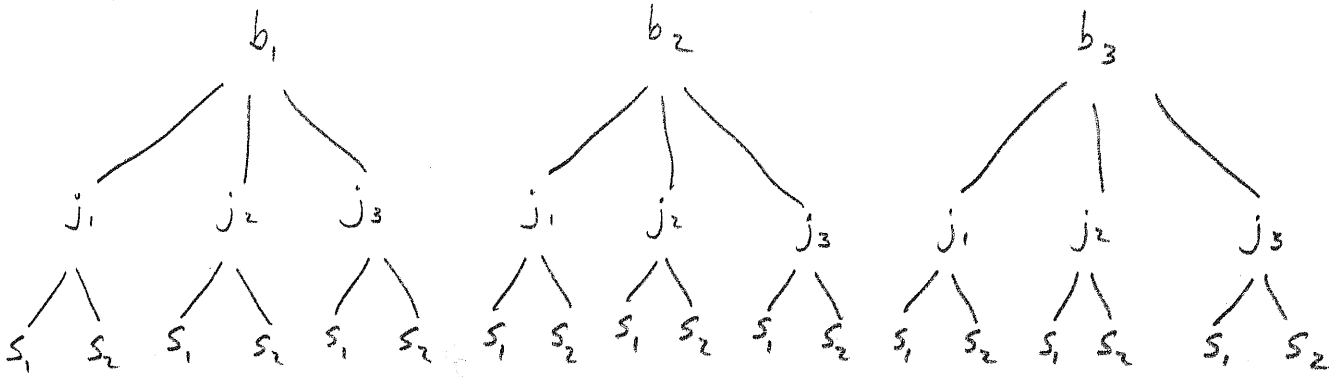
4. How many different 7-digit telephone numbers can be made if the first digit cannot be 7, 8, or 9?

5. From a group of 12 volunteers, a surveyor must choose 5 to complete an advanced survey. How many groups of 5 people can be chosen?

6. In one day, a salesman plans to visit 6 out of 14 companies that are in the neighborhood. How many ways can he plan the visits?

p. 486

(#2) $3 \cdot 3 \cdot 2 = 18$



Fundamental Counting Principle: $3 \cdot 3 \cdot 2 = 18$

(#3)

$$\underline{9} \cdot \underline{25}$$

↑ digits besides "0"

↑ letters besides "O"

$9 \cdot 25 = 225$

(#6) ${}_6P_3$ (order matters) $\quad \frac{6!}{(6-3)!} = \frac{6!}{3!} = 120$

(#7) ${}_{21}C_4$ (order doesn't matter)

$$\frac{21!}{4!\,(21-4)!} = \frac{21!}{4!\,17!} = \frac{21 \cdot 20 \cdot 19 \cdot 18}{4 \cdot 3 \cdot 2 \cdot 1} = 5985$$

p. 486

p. 3

#12) $26 \cdot 25 \cdot 24$ OR ${}_{26}P_3 = 15{,}600$

#31) YOUNG

$5!$

$5 \cdot 4 \cdot 3 \cdot 2 \cdot 1$

120

GEESE

$$\frac{5!}{1!\ 3!\ 1!} = \frac{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{3 \cdot 2 \cdot 1}$$

20

The E's in GEESE are identical, so the order of the E's is not important.

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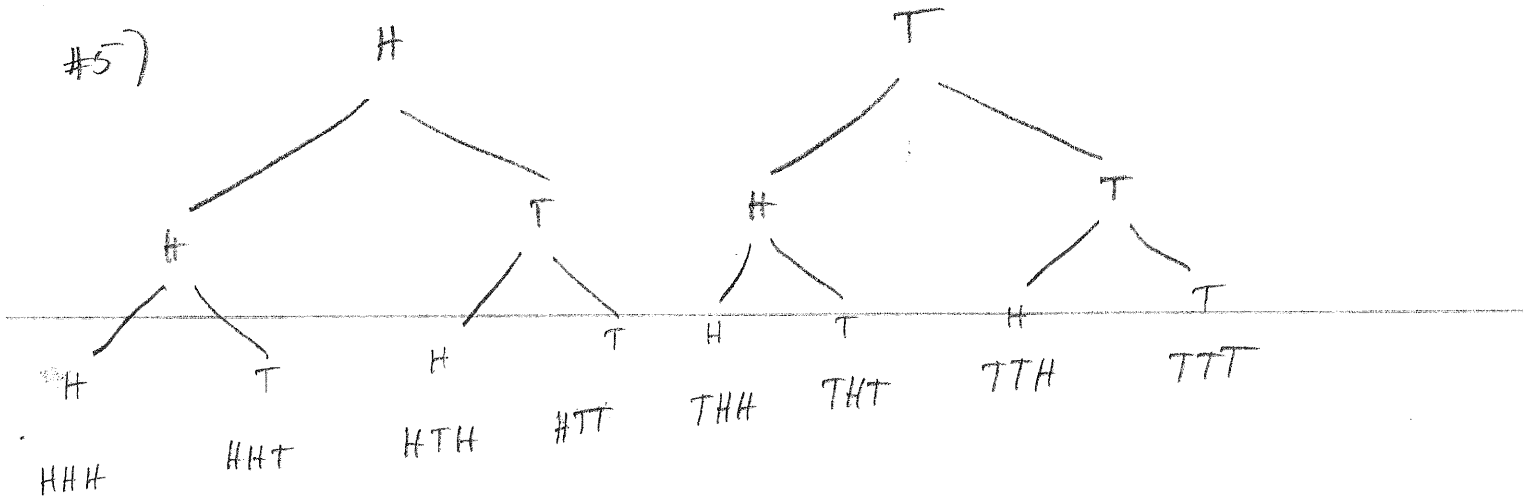
p. 494

#5)



$P(3 \text{ heads}) = \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{8}$

$P(3 \text{ tails}) = \frac{1}{2} \cdot \frac{1}{2} \cdot \frac{1}{2} = \frac{1}{8}$

$P(3 \text{ of the same}) = \frac{1+1}{8} = \frac{2}{8}$

$= \frac{1}{4}$

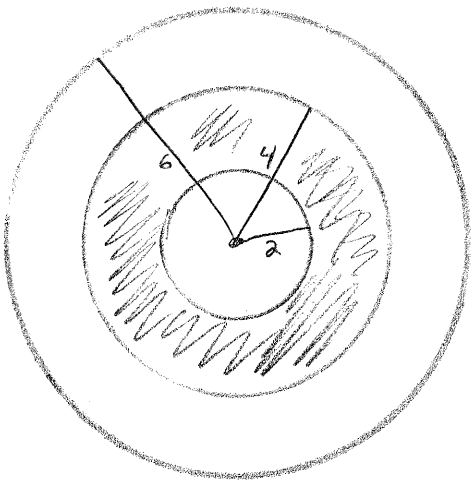
p. 494

#10)

p. 4

#11)

$P = \frac{A \text{ small circle}}{A \text{ whole}} = \frac{4\pi}{36\pi} = \frac{1}{9}$



$P = \frac{A \text{ shaded}}{A \text{ whole}} = \frac{A \text{ medium } \odot - A \text{ small } \odot}{A \text{ large } \odot} = \frac{16\pi - 4\pi}{36\pi} = \frac{12\pi}{36\pi} = \frac{1}{3}$

#12) $P(\text{Red}) = \frac{5}{20} = \frac{1}{4}$

#13) $P(\text{Red or Blue}) = \frac{5+7}{20} = \frac{12}{20} = \frac{3}{5}$

#18) $\frac{1}{{}_7C_2}$ (order not important) $= \frac{1}{21}$

p.494

Starting with:

[1] [2] [4] [4] [4]

26a)

P(5 of a kind) = P(4,4) $= \frac{1}{36}$

26b)

P(4 of a kind)

= P(4, not 4)

$= \frac{10}{36} = \frac{5}{18}$

	1	2	3	4	5	6
1				x		
2				x		
3				x		
4	x	x	x		x	x
5				x		
6				x		

26c) P(3 of a kind)

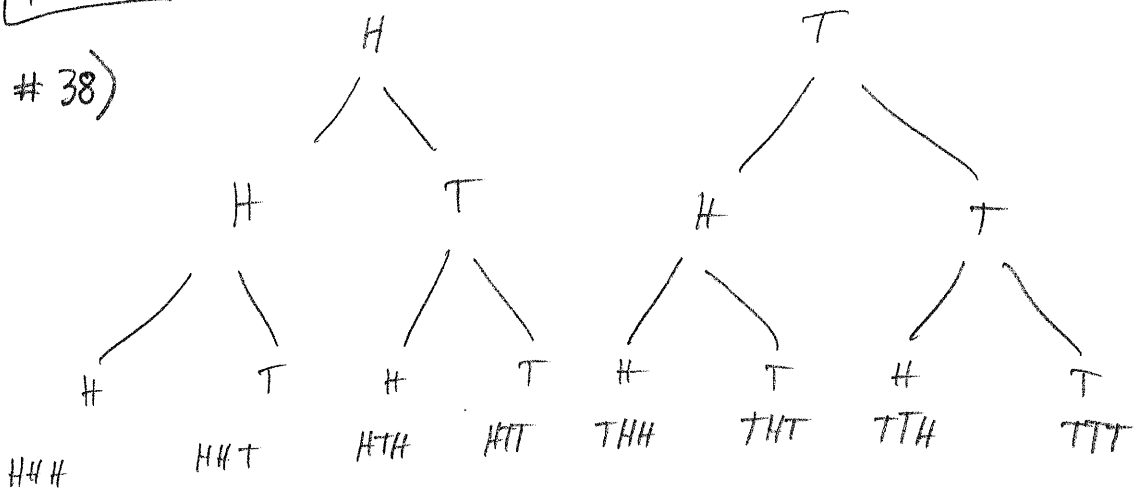
= P(not 4, not 4)

$= \frac{25}{36}$

	1	2	3	4	5	6
1	x	x	x		x	x
2	x	x	x		x	x
3	x	x	x		x	x
4						
5	x	x	x		x	x
6	x	x	x		x	x

p. 494

#38)



OR

$2 \cdot 2 \cdot 2 = 8$

C

#39)

	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

$P(\text{Sum of } 5) = \frac{4}{36}$

$= \frac{1}{9}$

H

p. 503

(4)

P(blue 4 and the product < 20)

$\frac{4}{36} = \frac{1}{9}$

Yellow \ Blue	1	2	3	4	5	6
1				×		
2				×		
3				×		
4				×		
5						
6						

(5)

P(yellow is a mult. of 3 given that the product is 6

$\frac{2}{4} = \frac{1}{2}$

Yellow \ Blue	1	2	3	4	5	6
1						×
2			×			
3		(×)				
4						
5						
6	(×)					

p.503

#14)

	1990	1995	2000	
Cuba	10,645	17,937	20,831	49,413
Ghana	4,466	3,152	4,344	11,962
Spain	1,886	1,321	1,264	4,471
	16,997	22,410	26,439	65,846

a) P(that a selected person is from Cuba, given that the person immigrated in 1990) $= \frac{10,645}{16,997}$

≈ 0.6263

b) P(that a person came from Spain and immigrated in 2000)

$= \frac{1264}{65846} \approx 0.019196$

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c) P(that a selected person immigrated in 1995, given that the person was from Ghana)

$= \frac{3152}{11,962} \approx 0.263501$

p. 503

#17) 1 2 3 4 5 6 7 8 9

P(even) · P(even | even)

$\frac{4}{9} \cdot \frac{3}{8} = \frac{12}{72} = \frac{1}{6}$

$\frac{1}{6}$; dependent

#18)

P(even) · P(even)

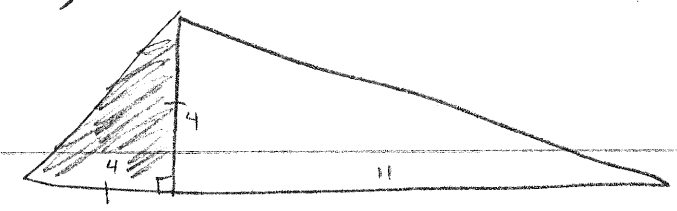
$\frac{4}{9} \cdot \frac{4}{9} = \frac{16}{81}$

$\frac{16}{81}$; independent

p. 509

#1) $\underline{10} \cdot \underline{9} \cdot \underline{8} \cdot \underline{7} \cdot \underline{6}$ or ${}_{10}P_5$ = 30,240

#6)



15

$P = \frac{A_{shaded}}{A_{whole}} = \frac{A_{small\ \triangle}}{A_{large\ \triangle}} = \frac{\frac{1}{2} \cdot 4 \cdot 4}{\frac{1}{2} \cdot 15 \cdot 4} = \frac{8}{30} = \frac{4}{15}$

p. 514

p. 10

#5)

plays an instrument \ plays a sport	Yes	No	Total
Yes	47	38	85
No	51	67	118
Total	98	105	203

a)

plays an instrument \ plays a sport	Yes	No	Total
Yes	0.23	0.19	0.42
No	0.25	0.33	0.58
Total	0.48	0.52	1

b) P(plays a sport given they play an instrument)

$\frac{.23}{.42}$ ≈ 0.55

c) P(plays an instrument given they play a sport)

$\frac{.23}{.48}$ ≈ 0.48

p. 528

p. 11

#4)

$\underline{7} \quad \underline{10} \quad \underline{10} \quad \underline{10} \quad \underline{10} \quad \underline{10} \quad \underline{10}$

↑ not 7, 8, 9

$= 7{,}000{,}000$

#5)

$_{12}C_5 \qquad \frac{12!}{5!\,(12-5)!} = \frac{12!}{5!\,7!}$

order is not important

$= \frac{12 \cdot 11 \cdot 10 \cdot 9 \cdot 8}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1} \qquad 792$

#6)

$_{14}P_6 \qquad \frac{14!}{(14-6)!} = \frac{14!}{8!}$

order is important

$= 14 \cdot 13 \cdot 12 \cdot 11 \cdot 10 \cdot 9 \qquad = 2{,}162{,}160$