

FACTORS AND MULTIPLES

Name: Key Date: _____ Period: _____

CHAPTER 3: SPIRAL REVIEW

1. Tell whether each number in the table is divisible by 2, 3, 4, 5, 6, 9, and 10 by placing a check in the appropriate columns.

	2	3	4	5	6	9	10
90	✓	✓		✓	✓	✓	✓
416	✓		✓				
1,036	✓		✓				
636	✓	✓	✓		✓		
450	✓	✓		✓	✓	✓	✓
912	✓	✓	✓		✓		
252	✓	✓	✓		✓	✓	
345		✓		✓			
209							
810	✓	✓		✓	✓	✓	✓

2. Use the Order of Operations to solve the following problems:

a. $7 \cdot 3^2 + (54 \div 9)$

$$\begin{array}{r} 7 \cdot 9 + (6) \\ \hline 63 + 6 \\ \hline 69 \\ \hline \end{array}$$

b. $(8^2 \div 8) + (9 \cdot 5)$

$$\begin{array}{r} 64 \div 8 + 45 \\ \hline 8 + 45 \\ \hline 53 \\ \hline \end{array}$$

3. Write an algebraic expression that states "5 less than a number".

$$n - 5$$

4. Factor each number to a product of its prime numbers. Write your final answer in exponential form. If a number is prime, write the word "Prime" in the box.

$ \begin{array}{c} 260 \\ \wedge \\ 2 \quad 130 \\ \quad \wedge \\ \quad 13 \quad 10 \\ \quad \quad \wedge \\ \quad \quad 2 \quad 5 \\ \\ 2^2 \cdot 5 \cdot 13 \end{array} $	$ \begin{array}{c} 123 \\ \wedge \\ 3 \quad 41 \\ \\ 3 \cdot 41 \end{array} $	$ \begin{array}{c} 507 \\ \wedge \\ 3 \quad 169 \\ \quad \wedge \\ \quad 13 \quad 13 \\ \\ 3 \cdot 13^2 \end{array} $
$ \begin{array}{c} 109 \\ \\ \text{prime} \end{array} $	$ \begin{array}{c} 300 \\ \wedge \\ 3 \quad 100 \\ \quad \wedge \\ \quad 10 \quad 10 \\ \quad \quad \wedge \quad \wedge \\ \quad \quad 2 \quad 5 \quad 2 \quad 5 \\ \\ 2^3 \cdot 3 \cdot 5^2 \end{array} $	$ \begin{array}{c} 125 \\ \wedge \\ 5 \quad 25 \\ \quad \wedge \\ \quad 5 \quad 5 \\ \\ 5^3 \end{array} $
$ \begin{array}{c} 351 \\ \wedge \\ 3 \quad 117 \\ \quad \wedge \\ \quad 3 \quad 39 \\ \quad \quad \wedge \\ \quad \quad 3 \quad 13 \\ \\ 3^3 \cdot 13 \end{array} $	$ \begin{array}{c} 105 \\ \wedge \\ 5 \quad 21 \\ \quad \wedge \\ \quad 3 \quad 7 \\ \\ 3 \cdot 5 \cdot 7 \end{array} $	$ \begin{array}{c} 2,525 \\ \wedge \\ 25 \quad 101 \\ \quad \wedge \\ \quad 5 \quad 5 \\ \\ 5^2 \cdot 101 \end{array} $

5. A banquet hall purchased 196 cloth napkins for place settings. There are eight tables in the executive section. Can each location have the same number of place settings? no.
 Explain why or why not and state the possible number of place settings at each table.

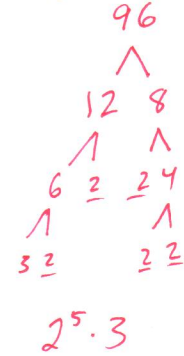
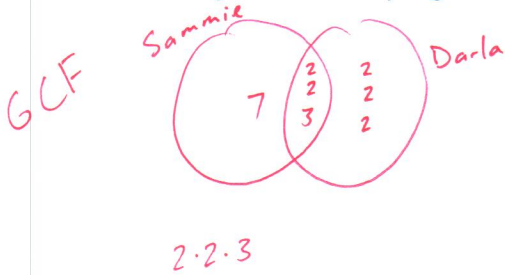
$196 \div 8$ is not an integer. Instead, there could be 4 tables with 24 places and 4 tables with 25 places

6. Use exponents to write the numbers three different ways:

81	3^4	9^2	$3 \cdot 3 \cdot 3 \cdot 3$
64	2^6	8^2	4^3
16	2^4	4^2	$2 \cdot 2 \cdot 2 \cdot 2$

7. In each problem below, determine if you should use the GCF or LCM to find your answer. Write "GCF" or "LCM" in the margin beside each problem, and then solve.

a. Sammie made a row of tiles 84 centimeters long. Darla's row was 96 centimeters long. What is the largest size tile they might have been using if all tiles were the same length? Explain.



The tiles were 12 cm.

b. Taylor is buying cookies and juice boxes for her class. Cookies are sold by the dozen, and juice boxes come 8 in a pack. What is the least number of packages of each that Taylor can buy in order to have one cookie for each juice box? Show how you arrived at your answer.

LCM

cookies	12	24	36	...
juice	8	16	24	...
#	1	2	3	...



24 of each, $24 \div 8 = 3$
 $24 \div 12 = 2$

Taylor will buy 2 packs of cookies and 3 packs of juice boxes.

c. The trolley stops at every third corner in downtown San Antonio. On the same route, the city bus stops at every eighth corner. If the trolley and the bus leave at the same time following the same route, what is the first corner that they will both stop at?

LCM

trolley	3	6	9	12	15	18	21	24
bus	8	16	24					
stop #	1	2	3	4	5	6	7	8

The trolley and bus will both stop at the 24th corner.

- d. Mr. Carter's gym classes will be competing in groups to finish a set of obstacle courses. There are a total of 84 girls and 126 boys in all of his classes. What is the largest number of identical groups that Mr. Carter can form so that everyone participates and nobody is left out?

GCF

$$\begin{array}{c}
 84 \\
 \wedge \\
 42 \quad 2 \\
 \wedge \\
 7 \quad 6 \\
 \wedge \\
 2 \quad 3 \\
 2^2 \cdot 3 \cdot 7
 \end{array}$$

$$\begin{array}{c}
 126 \\
 \wedge \\
 63 \quad 2 \\
 \wedge \\
 7 \quad 9 \\
 \wedge \\
 3 \quad 3 \\
 2 \cdot 3^2 \cdot 7
 \end{array}$$

He can form $2 \cdot 3 \cdot 7 = 42$ groups with 2 girls and 3 boys in each.

- e. A frog and a grasshopper start jumping at the same time from the same location. The frog jumps 16 cm, and the grasshopper jumps 12 cm with each leap. What is the first spot they will both land on?

LCM

$$\begin{array}{c}
 16 \\
 \wedge \\
 4 \quad 4 \\
 \wedge \quad \wedge \\
 2 \quad 2 \quad 2 \quad 2
 \end{array}$$

$$\begin{array}{c}
 12 \\
 \wedge \\
 3 \quad 4 \\
 \wedge \\
 2 \quad 2
 \end{array}$$

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 3$

They will both land at 48 cm.

- f. Sasha keeps her room tidy by performing certain tasks on a specific schedule. For example, she vacuums her carpet every three days, dusts her furniture every other day, and cleans the windows once a week. If she did all three tasks on the same day, May 1st, what is the next date she will again perform all three on the same day?

vacuum	3	6	9	12	15	18	21	24	27	30	33	36	39	42		
dust	2	4	6	8	10	12	14	16	18	20	22	24	26	28	30	32
windows	7	14	21	28	35	42										

Sasha will do all three tasks again on day 42.
(June 12)

May 1 0
 May 31 30
 June 1 31
 June 12 42

34
36
38
40
42

8. Use the calendar to answer the following questions:

Sun	Mon	Tues	Wed	Thurs	Fri	Sat
		^c 1 ^B	2	3	^c 4	5 ^B
^P 6	^c 7	8	9 ^B ^c	10	^P 11	12
^c 13 ^B	14	15	^c 16 ^P	^B 17	18	^c 19
20	^B 21 ^P	^c 22	23	24	^c 25 ^B	^P 26
27	^c 28	29 ^B	30	^c 31 ^P		

Connor enrolled in summer classes at his local library. He signed up to attend Culinary Skills for Kids every three days, Bird Watching every 4 days, and Painting classes every 5 days. Now, he's worried that he may have signed up for too many classes! His first day of classes was the 1st of the month.

a. On which days does he only have the Culinary Skills class?

X, 4, 7, 10, 13, 16, 19, 22, 25, 28, 31 → 4, 7, 10, 19, 22, 28

b. On which days does he only have the Bird Watching class?

5, 9, 17, 29

c. On which days do both the Culinary Skills and Bird Watching classes meet?

1, 13, 25

d. On which day(s) do both the Bird Watching and Painting Classes meet?

1, 21

e. How many times do the Culinary Skills and Painting classes meet on the same day? 3

What dates? 1, 16, 31

f. Do all three classes ever meet on the same day? yes Explain.

On day 1. (The LCM of 3, 4, and 5 is 60, so they will not all meet on the same day until the 60th day.)

9. Find the LCM and GCF of these numbers: 12, 20, 30.

LCM = 2 · 2 · 3 · 5 = 60 GCF = 2

$$12 = 2^2 \cdot 3 = 2 \cdot 2 \cdot 3$$

$$20 = 2^2 \cdot 5 = 2 \cdot 2 \cdot 5$$

$$30 = 2 \cdot 3 \cdot 5 = 2 \cdot 3 \cdot 5$$

10. Compare and contrast the factors and multiples of an integer. Choose a number to use as an example, but also write an explanation using complete sentences.

(Answers will vary.) There are a set number of factors. For 12, the factors are 1, 2, 3, 4, 6, 12.

Factors are less than or equal to the number.

There are an unending list of multiples of a number. For 12, some multiples are 12, 24, 36, 48, ...

Multiples are greater than or equal to the number.