Name _____ Class _____ Date _____

Puzzle 3-1

Divisibility and Mental Math

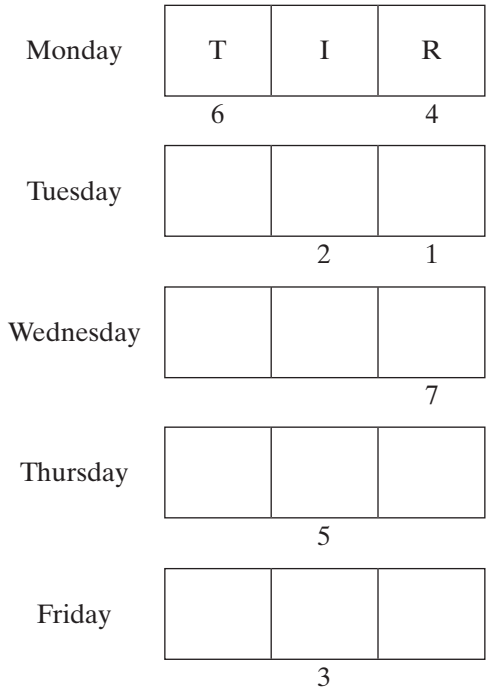
Waiters hate to see the not-so-friendly lunch group come into the restaurant each weekday. Since no one in the group likes the other members, the bill must come out to be exactly the same for each person to the last penny. This rarely happens, so the group must usually order a shared dessert in order to make the final bill an even split. On Monday, 9 members had lunch with a total bill of $132.65. Since this bill is not divisible by 9, the group ordered tiramisu for $4.42. This made the total bill $137.07, which is exactly divisible by 9. Each person paid $15.23 for lunch. Below is the dessert menu for last week. Decide which dessert the group ordered each day from Tuesday through Friday. Put the dessert code into the answer chart then decode the secret word.

Lunch Checks of the Not-So-Friendly Lunch Group

Day	Number for Lunch	Total before Dessert
Mon	9	$132.65
Tues	10	$141.73
Wed	3	$44.74
Thu	5	$78.24
Fri	9	$147.47

Dessert Menu

Dessert Code	Dessert	Price
LIM	Lime Sherbet	$4.21
TIR	Tiramisu	$4.42
CAR	Carrot Cake	$4.54
KEY	Key Lime Pie	$4.19
CHC	Chocolate Mousse	$3.87



What the not-so-friendly lunch group really needs is a little

_____ _____ _____ _____ _____ _____ _____ !

1 2 3 4 5 6 7

Name _____ Class _____ Date _____

Puzzle 3-2

Exponents

There is no quicker way for numbers to increase to the stars than with exponents. Answer each question below; let the exponent guide your path through the chart. Continue until you reach the stars!

1. $2^{\square}$ = The value of the starting block. Move up ☐ square(s).
2. $5^{\square}$ = The value of the current square. Move ☐ square(s) to the right.
3. $3^{\square}$ = The value of the current square. Move up ☐ square(s).
4. $7^{\square}$ = The value of the current square. Move ☐ square(s) to the right.
5. $3^{\square}$ = The value of the current square. Move up ☐ square(s).
6. $8^{\square}$ = The value of the current square. Move ☐ square(s) to the right.

243	625	27	81	1	64	49	☆
49	25	27	625	243	8	9	32
256	9	125	256	49	32	49	4
512	16	32	1	64	625	64	27
64	4	343	243	49	81	9	125
25	8	3	27	49	64	4	216
125	216	256	2	1	625	243	16
4	9	16	81	512	32	49	81

Starting Block →

Name _____ Class _____ Date _____

Puzzle 3-3

Prime Numbers and Prime Factorization

The clues are everywhere in the Prime Scene. Factor the following numbers down to their primes, then eliminate these prime factors from the diagram below. Unscramble the remaining letters to find the mystery word.

1. 55

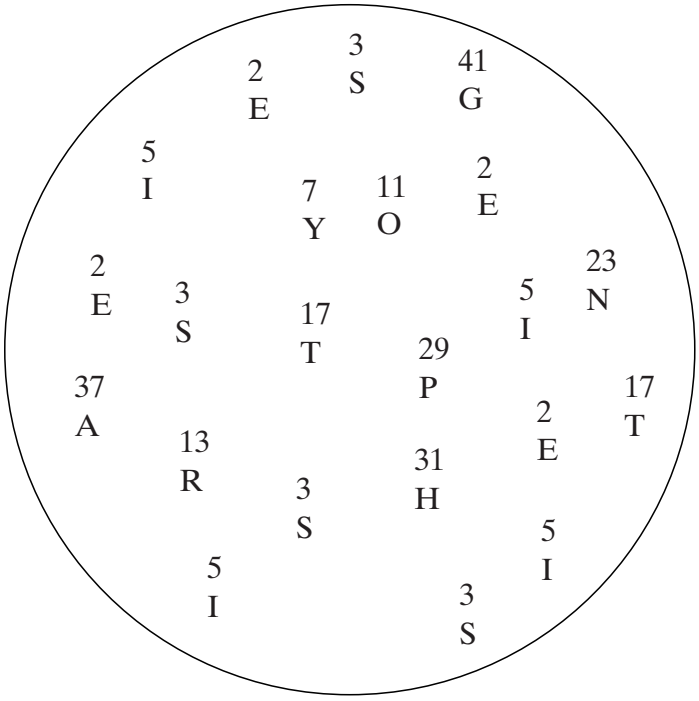
2. 30

3. 93

4. 102

5. 130

PRIME SCENE



The _____ _____ _____ _____ _____ _____ _____ _____ _____ developed the first accurate calendar.

Name _____ Class _____ Date _____

Puzzle 3-4

Greatest Common Factor

GCF mix-up!

The puzzle below contains eight pairs of numbers. Cut out each square carefully and match each pair of numbers to its GCF. When you are finished, all the puzzle pieces should join together so that the numbers and their GCFs are in boxes directly next to each other.

1. 12, 45

2. 12, 24

3. 30, 90

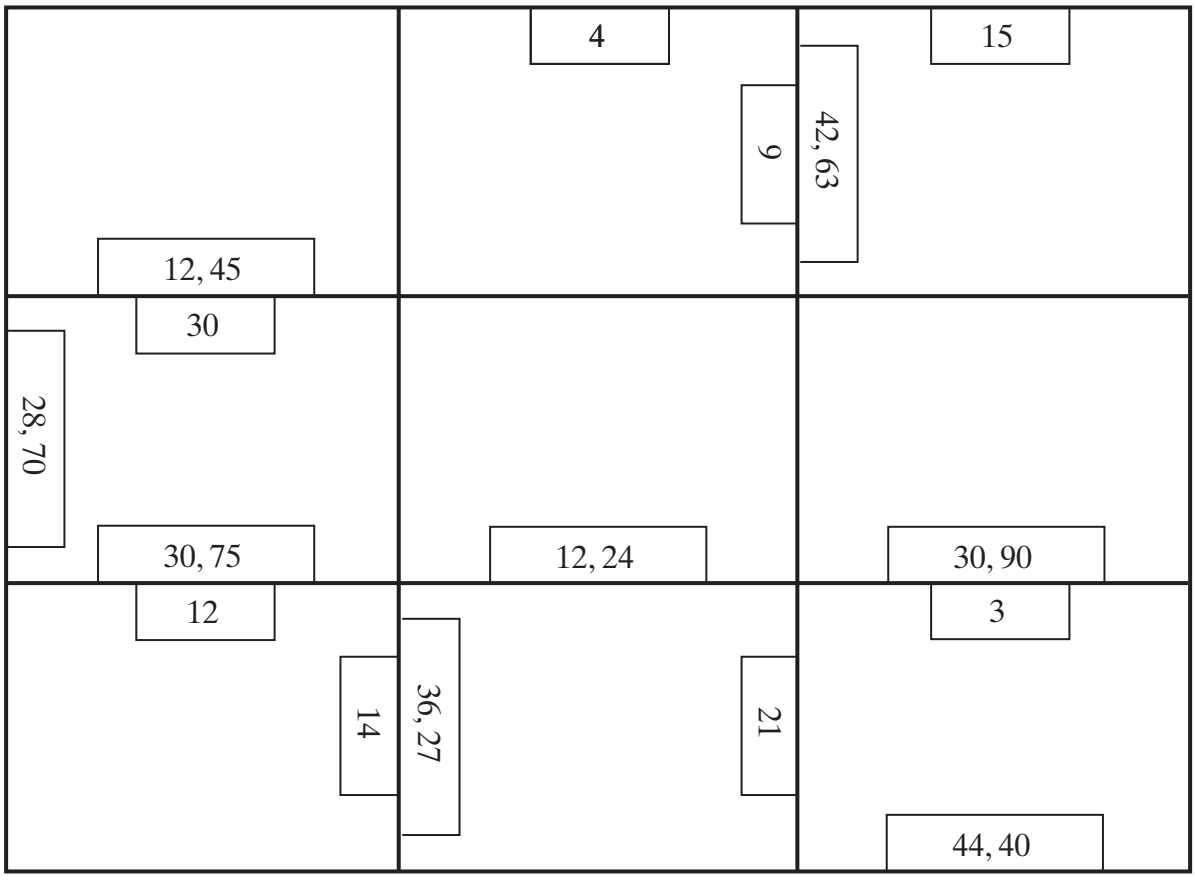
4. 44, 40

5. 28, 70

6. 30, 75

7. 42, 63

8. 36, 27



Name _____ Class _____ Date _____

Puzzle 3-5

Least Common Multiple

Find the least common multiple of each set of numbers. Circle the answers in the number grid. Each two-digit answer must go from left to right or from top to bottom. Many numbers are circled more than once. The two remaining digits form the solution to the puzzle.

1. 8, 11

2. 13, 5

3. 3, 7

4. 21, 63

5. 6, 10

6. 4, 12

7. 3, 5

8. 4, 9

9. 2, 4, 5

10. 4, 6, 8

11. 2, 4, 22

12. 2, 3, 7

13. 3, 5, 9

14. 3, 4, 7

6	4	3	6	3
1	5	0	6	5
2	4	8	4	0
1	4	8	2	0

The maximum number of game pieces in a Chinese checkers board is _____.

Name _____ Class _____ Date _____

Puzzle 3-6

The Distributive Property

Use the distributive property to find the missing numbers in the equations.

1. $8 \times (3 + 7) = (\square \times 3) + (8 \times \square)$
   A T
2. $2 \times (11 + 18) = (2 \times \square) + (2 \times \square)$
   H K
3. $4 \times (9 + 10) = (\square \times 9) + (4 \times \square)$
   N Y
4. $5 \times (24 - 17) = (5 \times \square) - (\square \times \square)$
   Z O E
5. $(6 \times 3) + (6 \times 1) = \square \times (\square + \square)$
   S F R
6. $9 \times (3 + 2 + 13) = (\square \times 3) + (9 \times \square) + (9 \times \square)$
   B D W

Now use your answers to discover some interesting facts about numbers and letters.

The letters ___, ___, ___, ___, ___, and ___ are written using three lines.
8 3 11 18 4 24

The word *four* has 4 letters. Because of this pattern, 4 is called

an ___ ___ ___ ___ ___ ___ number.
11 5 4 17 6 7

Name _____ Class _____ Date _____

Puzzle 3-7

Simplifying Algebraic Expressions

Simplify the algebraic expressions to find the missing terms in each expression.

1. $10b - 4 + 3b + 2 =$ **A** $\square$ $-$ **B** $\square$
2. $5 + 5x - 3y + 4 =$ **C** $\square$ $-$ **D** $\square$ $+$ **E** $\square$
3. $4b - \text{b} + 6 =$ **F** $\square$ $+$ **G** $\square$
4. $y + 2y + 5 + 4y =$ **H** $\square$ $+$ **I** $\square$
5. $c + c - 3b =$ **J** $\square$ $-$ **K** $\square$
6. $10y - 14 + 6b + 8b =$ **L** $\square$ $+$ **M** $\square$ $-$ **N** $\square$
7. $24c - 16 + 4 - 8c =$ **O** $\square$ $-$ **P** $\square$
8. $25y + 16c + 25c - 18b + 9 =$ **Q** $\square$ $+$ **R** $\square$ $-$ **S** $\square$ $+$ **T** $\square$

Now use your terms to find out facts about this puzzle.

The terms ___, ___, ___, ___, ___, ___, ___ are "like" terms.
B E G I N P T

The terms ____, ___, ___, ___, ___ are "like" terms.
A F K M S

The terms ___, ___, ___, ___ are "like" terms.
D H L Q

The terms ___, ___, ___ are "like" terms.
J O R