# Week Week MATHEMATICS Essentials G



### Math Trivia

In the 17th century John Napier (1550 - 1617) of Scotland devised a set of rods called Napier's bones, used by merchants to perform their accounting. He was from a famous military family and predicted the invention of submarines, military tanks, and machine guns even though he himself was not in the military.

Read more about Napier in *Mathematicians Are People, Too* by Luetta and Wilbert Reimer.

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#### Using Numbers in Powerful Ways

Suppose you wake up tomorrow morning and find that numbers could no longer be used.



Write a story about what might happen, telling how life would change.



#### Investigations

If it costs one penny to ride 1000 miles, a trip around the world would cost 25¢. What is the approximate circumference of the world at the equator? What would it cost to travel through the center of the earth at this rate? How can you answer these two questions with the data given to you in the first sentence?

A trip to the moon would cost \$240. About how far away is the moon? What is the approximate distance to the sun if a trip would cost \$930?

Use the rate of one penny for each 1000 miles and figure costs of trips from Alaska to Miami or Toronto to Mexico City. What trips in the northwestern hemisphere could you take for \$0.04?

(1.03)

(1.01c,d)



### Decimal Fraction Fun

A, B, C, and D are four numbers to be graphed on this number line. A > 0.5; C and A are equally distant from 1; B is halfway between 0 and 0.5; A + B = 0.80; D < C.

In what order will the points lie on the number line?



### For Further Study

How can you make the display on your calculator show 24.013 by using only the 0, 1, decimal point, and + keys?

(1.02a)

#### Let's Eat! Real World Mathematics

Here are five investigations which use menus. Read all five and then choose the two you want to complete. Be sure to organize your work so that others can follow what you have done.

1. You and your family are going on vacation. Your parents plan to cook breakfast and dinner at the campsite but they agree that you will eat out for lunch every day. You have the task of figuring out about how much money the family (6 people) will need to eat lunch every day, Sunday through Sunday. Since your mother is planning carefully, she wants very realistic figures. She will add tax and tips to the total.

2. For his eleventh birthday, Ross' uncle took four boys out to eat. Choose a restaurant, order four complete meals, and figure the costs. Taxes for the area are  $6\phi$  on every dollar. Ross' uncle said that he wanted to leave a 15% tip (multiply the total by 0.15 to figure the tip).

3. The class is planning a celebration. You must choose one basic meal and order for everyone in your class. Begin with an informal survey to see what would be the best menu and figure what the costs will be. The restaurant charges 22% for tax, tip, and delivery (multiply 0.22 by your total).

4. You have a part-time job which pays \$4.00 an hour. Because you are not able to work when it rains, you figure that you can work about 9 hours a week. Twice a week you plan to eat in a restaurant. What will you budget for meals? How much do you think you can save each week? Explain.

5. Wanda has a new job downtown. She plans to order lunch from a local restaurant each day, Monday through Friday. There is a food service which allows her to order her lunches a week in advance for a fee of  $50\phi$  per day. The food service will pick up her order and deliver it to her workplace at 12:30 p.m. Wanda decides this is a good service since she wants to visit the exercise center for 30 minutes each lunch break. Figure a week's worth of menus (different each day, please) to show what the food service lunches will cost Wanda.

\$0.99	Soda, Coffee, Tea, Iced Tea Small \$0.69 Medium \$0.85 Large	Milkshakes Small \$1.49 Medium \$1.79	Apple or Cherry Fritter \$0.79	French Fries \$0.79	with tornato, refutee, and spectral sauce	Chicken Burger \$2.59	Cheeseburger\$1.45(tomato and lettuce add 15¢)	Basic Burger \$1.29 (tomato and lettuce add 15¢)	Mushroom Big Burger \$2.29 with mushrooms, onions, and cheese	All-in-one Big Burger \$2.49 with tomato, lettuce, cheese, bacon, and special sauce	<b>Burger Palace</b>
Drinks (16 oz.)	Chocolate Chip Cookie Ice Cream Sundae	Fish with Fries Crab Cakes (2)	Steamed Rice Dockside	Egg Kolls (2) Fried Rice	Moo Goo Gai Pan	Chicken Chow Mein	Oriental Express Beef or Chicken w/Broccoli	Refried Beans Spicey Rice	Burrito (chicken or beef) Bean Burrito	<i>South of the Border</i> Taco (chicken or beef)	World Food Fa
\$ 0.89	\$ 0.89 \$1.25	\$2.49 \$2.15	\$0.89	\$1.89 \$1.59	\$2.29	\$2.15	\$2,29	\$ 0.79 \$ 0.79	\$1.39 \$ 0.99	<b>\$</b> .99	air

		Pizza Pa	- <u>-</u>
Mostly Chicke	n		
•		FIZZA DY UNE	lice
Two-Piece Dinner	\$2.99	Cheese	\$1.39
Three-Piece Dinner	\$3.99	Extra Toppings	add \$0.30
(both with slaw, fries, and roll)		ground beef, pepperoni, sausage, onions, mushro	oms, peppers, olives
All White Meat, please add $50\phi$		Pizza Speci	als
Chicken Sandwich	\$1.95	Cheese, Small	\$ 6.99
Grilled Chicken	\$2.39	Cheese, Medium	\$ 9.50
Chiolon Nurgate		Cheese, Large	\$12.95
		Extra Tonnings Small	each \$ 1 00
6-piece	51.99	Extua roppings, binui Extua Taminga Madini	
9-piece	\$2.79	EXITA TOPPINES, MEMUNI	each $1.23$
12-piece	\$3.89	Extra Toppings, Large	each \$ 1.50
	) ) )	Pasta	
Side Urders		Spaghetti w/meat sauce	\$ 4.95
Cole Slaw, French Fries,		Lasagna	\$ 7.95
<b>Onion Rings, Hush Puppies</b>	\$ 0.90 ea.	Ravioli	\$ 5.95
Rolls	\$ 0.50	Side Orde	S
- - -		Green Salad	\$ 2.95
Drinks		Garlic Bread	\$ 2.50
Lemonade	\$0.89	Drinks	
Soft Drinks, Tea, Coffee		Soft Drinks	\$ 0.89
Medium \$0.85 Large	\$0.95	Milk	\$ 0.75
		Tea or Coffee	\$ 0.89

## Keeping Skills Sharp

- 1. 316 x 28
- 2. 913 ÷ 7
- 3. 38.6 1.57
- 4.  $8 \ge n = 72$
- 5. Walter found a big difference in the price of colas. To plan a budget for a camping trip, he decided to use the cheapest brand . The prices of the four different colas were \$1.30, \$1.50, \$0.99, and \$1.25. What did he save by buying the cheapest colas rather than the most expensive if he needed ten six-packs?
- 6. 1.8 + .65 + 23
- 7. Which is a better buy? 4 yards of ribbon for 69¢ a yard or 5 yards of ribbon for \$3.25
- 8. Jennifer's swim team coach wanted her to practice laps for 45 minutes each morning before the group worked together at 6:30 a.m. What time does she need to begin her laps?

### Solve this!

If Jon, Mac, and Heather are taking a group photo, how many different ways can the photographer line them up? When Taneeka, Chad and Kim join them, how many ways can they all be lined up?

Later that day two of these six students are going to pick up snacks for the group. How many different ways can two people be selected to pick up snacks?



# To the Teacher ... WEEK 16

#### For Further Study:

10 + 10 + 1 + 1 + 1 + 1 + .01 + .001 + .001 + .001 + .001

Solve This: 6; 720; 15

Decimal Fraction Fun: D, C, 1, B, A

## Mental MathDirections to Students: Number your paper from<br/>1 to 10. Write your answers as the questions are calledK1. $(15 + 8 + 4) \div 9$ out. Each question will be repeated only once.1.2. $(13 + 6 - 7) \div 4$ 2.

- 3. 2/5 of 10
- 4. Estimate the product: 23 x 4
- 5. Factors of 30
- 6. The distance around a circle
- 7. Term for 1000 grams
- 8. Ounces in 1/2 pound
- 9. Years in 36 months
- 10. Perimeter of square 4 ft. on each side

#### **Keeping Skills Sharp**

- 1. 8848
- 2. 130 r 3
- 3. 37.03
- 4. 9
- 5. \$5.10
- 6. 25.45
- 7. 5 yards for \$3.25
- 8. 5:45 a.m.

# by Week MATHEMATICS Essentials...



Week

#### Math Trivia

The bar code symbol you see on most of your grocery items is composed of a set of numbers that tells the cash register in the store what kind of product it is, who made it, and something about its size, color, and the like. It does not say what the price is; that has to be programmed into the cash register separately. This system was begun in 1973 by the Uniform Code Council in Dayton, Ohio.



#### Investigations

A pilot, a cab driver, a sailor, and an engineer are named Peter, Connie, Sam and Evelyn.

- only one person's name and occupation begin with the same letter
- Sam is taller than either the cab driver or Evelyn.
- The engineer is younger than the pilot.
- Connie is the oldest and a neighbor of the cab driver.
- Sam is older than Peter.

(4.01)



#### Using Numbers in Powerful Ways

Imagine that \$1,001,100 is stacked in your school's lunchroom. This sum is entirely made up of coins, and there are exactly the same number of pennies, nickels, dimes, quarters, and silver dollars. Determine how many coins of each denomination you would need to make \$1,001,100.



Hint: Start with equal numbers of coins that total \$100.11, and then multiply by 10,000.

(1.03, 5.01)



### Decimal Fraction Fun

What part of the whole square is section A? What part of the whole square is section B + D?

What part of the whole square

is section A + B + G + H? What part of the whole square is section D + F + C?



(1.01a)



### For Further Study

What is the Euro and which countries are using it? What are the benefits for these countries?

What effect will the use of the Euro have on the United States?

#### Adopt a Number

This is a project for the second half of the school year. You are getting a headstart this week. At the end of the project you will be part of a big celebration for the adopted numbers and will have an opportunity to present your special number to the class. Below are some guidelines. Use the form at the bottom of the page to let your teacher know what number you have chosen.



- 1. Your number may be any decimal, fraction, or whole number you choose. Try to select a number that others may not think of, but keep in mind the guidelines.
- 2. Collect information about your number and its use in everyday life (examples from newspapers, magazines, and television, use in literature, measurement, geometry, etc.)
- 3. Describe your number as it would fit in various classifications (i.e., odd or even, fraction or whole number, a factor of . . ., a multiple of . . . , a palindrome, etc.)
- 4. Create a game which focuses on your number and/or write its autobiography.
- 5. Use your number in a collection of story problems, riddles, and statistics. (For example, a cheetah can run for short distances at 70 mph.)
- 6. Be creative! Start now to think about presenting your number at the adoption celebration. Involve your family, friends, and neighbors!



## Keeping Skills Sharp

- 2.  $30 \div 5 \__6 x 9$  Use <, >, or =
- 3.  $7 \ge 7 \ge 7 = n$  n = ?
- 4. The average American uses 70 gallons of water a day. How many gallons of water would a community of 1200 people use in a day?
- 5. When Abraham Lincoln became President in 1861, he was 52 years old. In what year was he born?
- 6. Six-eighths minus four-eighths equals how many eighths?
- 7. \$39.42 + \$106.03 + \$8.19 = ?
- 8. 5+5+5+5=5 x \_\_\_\_



How many pennies placed side by side would it take to go around the perimeter of your classroom?



<sup>1. 152</sup> x 106

### Grade 5 To the Teacher.

Using Numbers in Powerful Ways: This is a challenge. It would take 71 coins of each denomination to give \$100.11. So, 710, 000 of each coin gives \$1,001,100. You may want to suggest solving a simpler problem as a strategy.

Investigations: Peter - cabbie, Connie - sailor, Sam - pilot, Evelyn - engineer

Directions to Students: Number your paper from Mental Math Directions to Students: Number your paper from 1 to 10. Write your answers as the questions are called out. Each question will be repeated only once.

- $9 \ge 8 + 8 \div 10 \ge 5$ 1.
- 2.  $8 \ge 5 + 14 \div 6$
- 3. Write in fraction and word form - .3
- 4. Estimate the product: 17 x 3
- Number of factors in 25 5.
- 6. Figures that are exactly the same size and shape
- 7. Meters in kilometer
- 8. Abbreviation for pound
- 9. Minutes in 120 seconds
- 10. \$5.00 less 75¢

#### **Keeping Skills Sharp**

- 16,112 1. <
- 2.
- 3. 334
- 4. 84,000 gallons
- 5. 1809
- 6. 2/8 or 2 eighths
- 7. \$153.64
- 8. 4

# Week by Week MATHEMATICS Essentials...



### Math Trivia

The Dewey Decimal System, named after the librarian Melvil Dewey (1851 - 1931), is a classification system which helps people locate books. All books can be classified in one of the ten categories which begin with 000-099 and go through 900-999. Books about mathematics and science are numbered 500-599.

*Idea:* Ask the librarian to relate the decimal notation used in the media center to your study of tenths, hundredths, and thousandths.



#### Investigations

What numbers can be expressed as the sum of consecutive numbers? For example, 5 may be expressed as 2 + 3. Work with 2 or 3 friends on the investigation on the next page. A chart is started for your use, but continue to complete the chart.



Compare the results from each group's work. What patterns do you see? Discuss the questions from the student sheets.

(1.03)



#### Using Numbers in Powerful Ways

Rebecca made up a number riddle with these clues:

1) I am thinking of a 5-digit odd number.

2) The sum of all its digits is 20.

3) The digits in the hundreds place and in the tens place are consecutive numbers.

4) When you multiply the digits in the tens and hundreds places, you get the digits for the thousands and ten-thousands places? What is Rebecca's number?

(1.01b)



### Decimal Fraction Fun

Bob and Ellen painted a fence in 6.5 hours. Bob worked for 3.8 hrs, how long did Ellen work?

(1.03)



What is the next number in this sequence?

$$\frac{1}{4}, \frac{7}{12}, \frac{11}{12}, \frac{5}{4} \cdots$$

(5.01)

#### **Consecutive Sums**

What numbers, 50 or less, can be written as the sum of consecutive numbers? Is there more than one way to express some numbers?



- A. Make other charts and continue through 50.
- B. What do you notice about numbers that cannot be written as consecutive sums? Those that may be written only one way? Those that may be written in more than one way?

(1.03, 5.01)





Sara went to the mall to buy her family presents. She spent \$20.00 of her money on a gift for her mother, then half of her remaining money on a gift for her dad. Sara's last gift, for her brother, cost her \$15.00. She left with \$10.00. How much money did she start with?



# To the Teacher ...

Crade 5

WEEK

#### **Using Numbers in Powerful Ways:**

20,459 or 42,671.

#### **Investigation Help**

1. 0 + 12. No 3. 1 + 2No 4. 2 + 35. 1 + 2 + 36. 7. 3 + 48. No 9. 4+5 or 2+3+41 + 2 + 3 + 410.

The students should discover that any number that is a power of 2 will not have a consecutive sum. Example:  $2^1$ ,  $2^2$ ,  $2^3$ ,  $2^4$ 

#### SolveThis:

\$70.00

#### **Suggested Strategy:**

Work backwards

For Further Study:  $1 \frac{7}{12}$  or  $\frac{19}{12}$ 

#### Directions to Students: Number your paper from Mental Math **Keeping Skills Sharp** 1 to 10. Write your answers as the questions are called out. Each question will be repeated only once. $(100 - 55) \div 9$ 1. 1452 1. 2. $(50 + 22) \div 8$ 13/100 2. 3. Write in fraction and decimal form 0.5 3. 35.88 4. Round to nearest ten: 7,349 4. 898 steps First four multiples of 8 5. 5. \$10.02 The distance around a rectangle 6. 18/8 = 21/46. 7. Abbreviation for kilometer 7. 26 8. Inches in 1/2 yard 8. 672 hours 9. Weeks in one year 10. $1 \frac{1}{2}$ hours before 5:00