



Calculate!

Use only the

5 **3** **-** and **=** keys to show 20.

Keys can be used more than once.

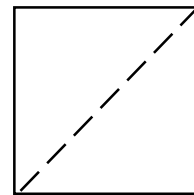
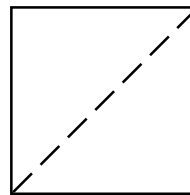
How did you do this?

(1.05, 5.02)



Looking Out For Math

Use four right triangles cut from two squares. How many different polygons can you create? Sketch each polygon you find.



Thinking Mathematically

What place in North Carolina has the highest elevation?



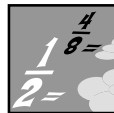
What place in North Carolina has the lowest elevation? What is the difference between the highest and the lowest places?

What is the elevation of your town?

Where did you find this information?

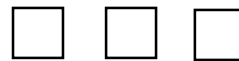
How do contour maps show elevation?

(1.05)



Fraction Action

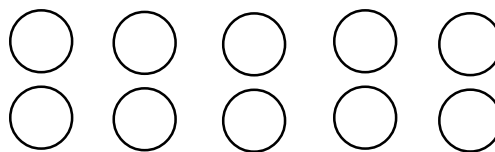
This is half of set **Q**. Add on to make the whole set.



This is one-third of set **S**. Add on to make the whole set.



This is two-thirds of set **J**. Add on to make the whole set.



Exploring Data

What are the favorite books of fourth graders?



Design a study to investigate this question. Are there ways to gather this information other than asking the students? Who might be interested in this information?

(4.01)

(1.03)

Pieces of Eight



Materials:

Number cubes.

Number of Players:

2 - 4

Rules:

1. Every player rolls the cubes and chooses one of the spaces he or she rolled. For example if the player rolls a 1 and 3, the player may choose, (1, 3) or (3, 1)
2. The player with the 8 in the place with the largest value wins the round. In case of a tie the player with the largest number wins.
3. Play 15 rounds. The player who wins the most rounds wins the game.

(1.01b)

1 2 3 4 5 6

284,935	453,829	359,842	259,348	895,432	935,428
245,893	529,438	389,452	594,832	485,392	423,985
948,325	942,385	843,529	938,425	824,593	284,953
823,459	538,924	325,984	829,534	532,984	593,824
982,453	954,823	342,958	583,249	935,248	358,294
423,589	498,235	358,924	394,285	459,238	834,529



Keeping Skills Sharp

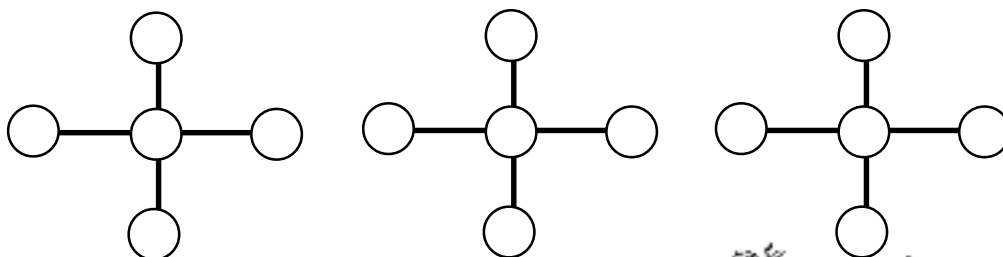
1. $447 + 2,816 =$
2. $6,493 - W = 4,304$
3. $14 \times R = 126$
4. $160 \div 4 =$
5. $K \div 5 = 16$
6. 1 nickel + 2 quarters + 8 pennies + 3 dimes
7. 10 pint = ____ quarts
8. What digit is in the thousands place: 534,068
9. Ned and Sue traveled with a tour group of 80 members. Half of them went to the zoo. They went through the zoo in four equal groups. How many people were in each group?
10. They went in the zoo shop. Sue bought four stuffed animals for \$5.00 each. Ned bought two posters for \$7.50 each. How much money did they spend?



Solve this!

(1.05)

Use only the numbers 1 to 5, one time each. Place them in this diagram. The sum in each direction must be the same. Try to find 3 different solutions.



Now try to do it with the numbers 6 to 10.

Show your solution on another paper.

Is there a strategy that helps you?



To the Teacher ..

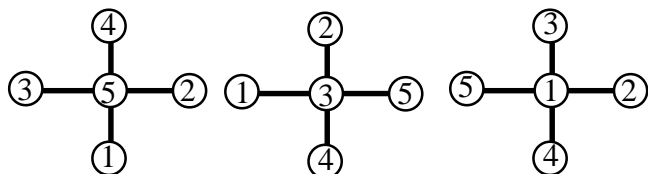
Grade 4
WEEK 5

Calculate!

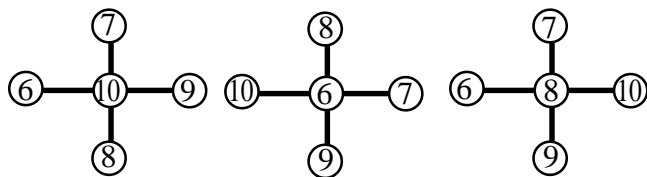
One possible solution:

$$53 - 33 = 20$$

Problem of the Week

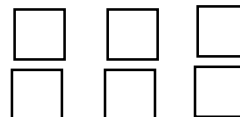


Notice one solution starts with the largest numbers in the range in the middle circle, another solution with the smallest number and then the middle number of the range.

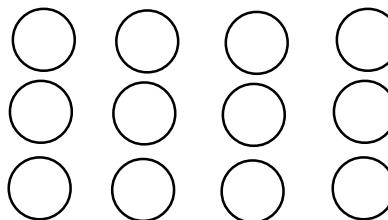


Fraction Action

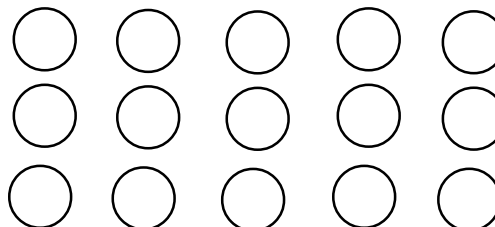
Set Q



Set S



Set J



Mental Math

Directions to Students: Number your paper from 1 to 8. Write your answers as the questions are called out. Each question will be repeated only once.

1. 20 less than 67
2. $7 + 20 - 3 + 4$
3. What hundred is 371 closer to: 300 or 400?
4. $85 + 9$
5. $20 \div 4$
6. Value of 3 quarters and 2 dimes
7. Number of inches in 1 foot
8. How many apples in 2 dozen?

Keeping Skills Sharp

1. 3,263
2. 2,189
3. 9
4. 40
5. 80
6. 93¢
7. 5
8. 4
9. 10
10. \$35



Calculate!

How old will you be when you are 1,000 weeks old?



(1.05)



Thinking Mathematically

Work with a partner. Choose a number between 11 and 32. Take that many counters. Divide your counters into equal groups. Do this for at least 10 different size groups. Record your results on a chart like this:

Your #	# in Each Group	# of Group	Leftovers Remainder
30	4	7	2

For which size groups did you have no left-overs? Why do you think this is true? (5.02)



(Review circle graphs)

Exploring Data

Count the number of counties in each of the three North Carolina regions. Graph information on a circle graph. To make a circle graph, begin with a strip with one hundred squares. Use green to represent coastal plain counties, yellow - piedmont counties, and brown - mountain counties. Color a square for each county and roll the tape into a circle. From the center of the circle, draw a radius to the ends of each color section. What can you learn from your graph? (4.01)



Looking Out For Math

Cut out a quadrilateral.

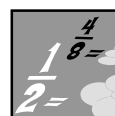


Tear off the corners.

Paste the corners side by side so each corner touches the same point. What do you notice?

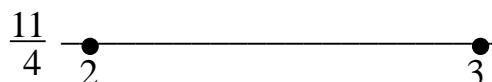
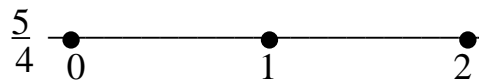
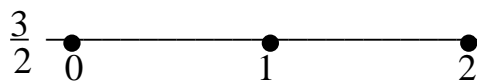
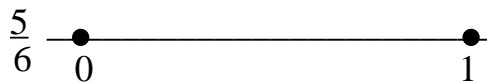
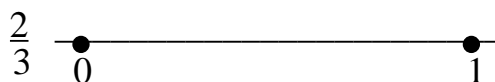
Try this for two other kinds of quadrilaterals.

Write about what happened.



Fraction Action

Put a point on the number line to show where the fraction should be.



(1.03)

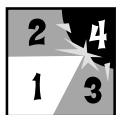
Multiplication Mark Off

12	20	16	40	18	27	64
100	36	4	56	24	30	12
63	0	49	72	25	8	48
48	10	60	0	14	26	9
54	32	27	35	56	49	21
30	16	63	40	144	18	72
42	28	15	60	81	6	24

Use a regular deck of cards to play this game. Let Aces = 1, Jacks = 11, Queens = 12, and Kings = 0.

Directions: Each player has 10 markers. At a turn, the player draws two cards and multiplies. If the product is uncovered on the board, the player may capture the spot. The first player to capture 10 spots wins.

(Review multiplication facts)



Keeping Skills Sharp

1. $188 + 72 + 3405 =$
2. $2,678 - 499 =$
3. $45 \div 9 =$
4. $200 \div 4 =$
5. $8 \times 70 =$
6. 12 feet = ____ yards
7. Number of sides on 3 hexagons
8. $>$, $<$, or $=$?? 2,685 2,865
9. Cody gets \$5.00 for allowance each Saturday.
On Monday, he bought a yo-yo for \$1.25.
On Tuesday, he played 5 video games for \$0.50 per game. How much has he spent?
10. Does Cody have enough left to buy a poster for \$1.50?



Solve this!



A Christmas Tree farmer in North Carolina has 24 trees to plant. In how many different rectangular arrays can she plant her trees?
Sketch your solutions.

(1.05)

To the Teacher ..

Grade 4

WEEK
6

Calculate!

Answer: 19 years old. Students should have the opportunity to share their strategies.

Thinking Mathematically

A good literature connection is 17 Kings and 42 Elephants by Margaret Mahy. Discuss with the students the idea of dividing equally the 42 elephants among the 17 kings. Looking at the recorded student data, students should see that leftovers are based on multiples.

Fraction Action

Students need to develop a "fraction sense". Is a fraction closer to 0, closer to one whole, or greater than one whole? This activity can provide an assessment of students' fraction sense.

Problem of the Week

Solutions: 6×4 , 2×12 , 1×24 , 8×3

Rectangular arrays are a geometric model for multiplication. Students need to have multiplication modeled as groups and as arrays. This leads into understanding area.

Mental Math

Directions to Students: Number your paper from 1 to 8. Write your answers as the questions are called out. Each question will be repeated only once.

1. Write four thousand three hundred
2. $21 - 5 + 3 + 3$
3. Nearest ten cents: 82¢
4. $120 - 3$
5. $45 \div 15$
6. Jane had 3 quarters. She spent 40 cents. How much does she have left?
7. Number of days in 3 weeks
8. Half of 46

Keeping Skills Sharp

1. 3665
2. 2179
3. 5
4. 50
5. 560
6. 4
7. 18
8. <
9. \$3.75
10. No



(5.02)

Calculate!

I am thinking of a number. When I add 55 to it and then multiply it by 2, I get 310. What is my number?

I am thinking about a number. If I multiply it by itself three times I get 625. What is my number?



Thinking Mathematically

Write a story that is illustrated by this equation:

$$2 \cdot 12 - 15 = 9$$

(5.02)



Exploring Data

Working with a partner, get a calculator. Have your partner time you for fifteen seconds as you count by ones by entering

$1 + = = =$. Record your ending number. Time your partner for 15 seconds. Record that number. Survey your classmates and present the class data as a bar graph.

(4.01, 4.02)

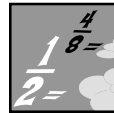


Looking Out For Math

On a geoboard, construct polygons having these attributes:

- just one right angle
- exactly two right angles
- six right angles
- three right angles and seven sides
- no right angles
- as many right angles as you can

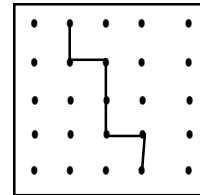
Record your polygons on a geoboard record sheet. (3.02)



Fraction Action

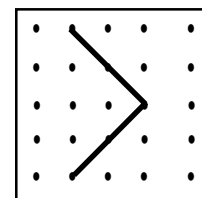
Divide a geoboard into halves in as many different ways as you can.

Draw your solutions on the geoboard recording sheet.



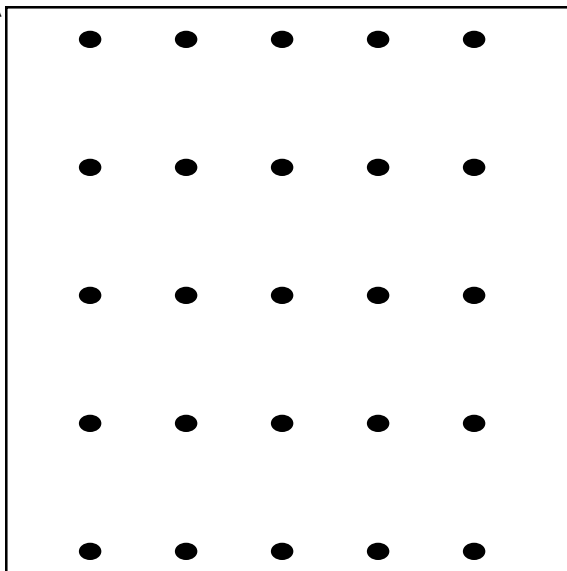
How many squares are in each half?

Is this geoboard divided into halves?

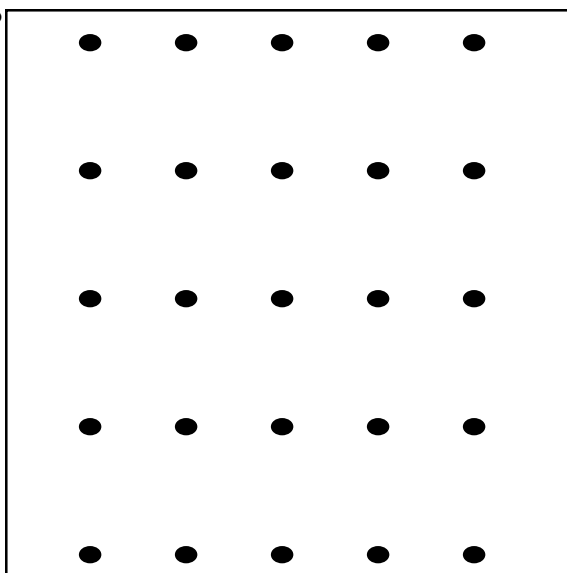


(1.03)

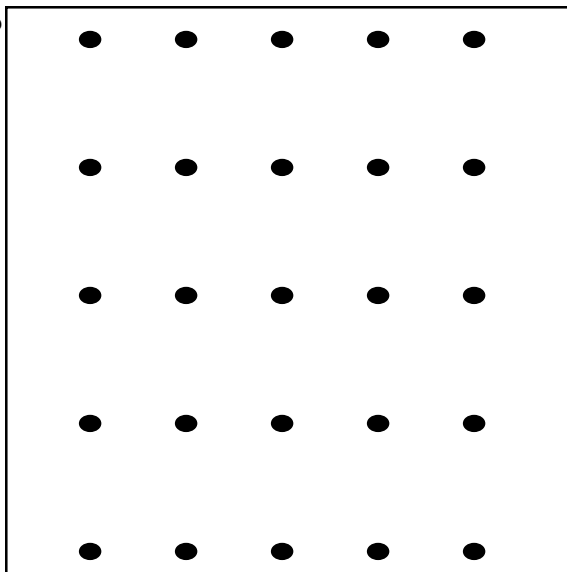
1.



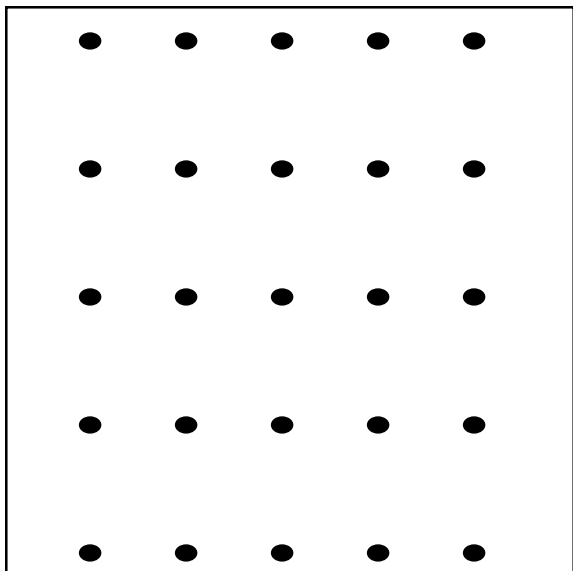
2.



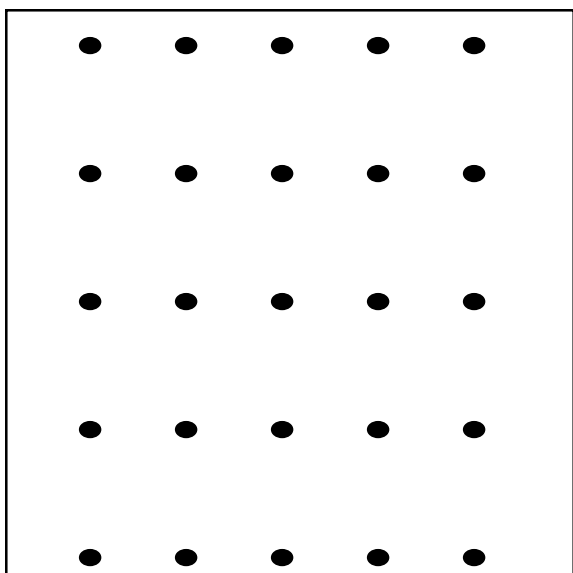
3.



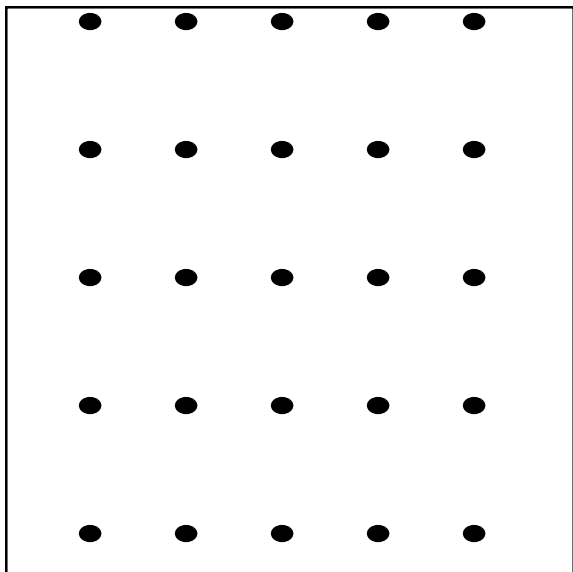
4.



5.



6.



CORN SHUCKS!

(3 to 8 players)

You will need

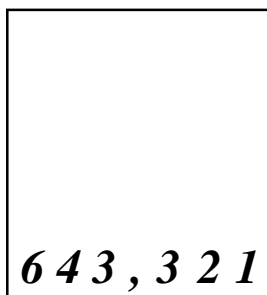
6 dice

paper and pencil



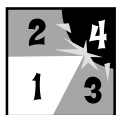
Game rules

1. The first player tosses all six dice and makes the largest possible six-digit number with those digits. Suppose the dice show these digits: 6, 4, 3, 3, 2, 1. That order makes the largest possible number for those dice. The player writes that number at the bottom of a sheet of paper.



2. The next player tosses all six dice and makes the smallest possible number for those digits. The player writes that number at the top of the same sheet of paper.
3. The next player tosses all six dice and must make a number between the other two. If the player cannot, he or she says "shucks" and is out of the game. If the player can, he or she writes the number between the first and last numbers.
4. The next player tosses the dice and must also make a number between the first and the last number. It should be written so that all the numbers on the paper are in order from top to bottom. If the player cannot make a number between the largest and smallest, or if he or she writes the number so that the numbers are not in order from top to bottom, the player says "shucks" and is out of the game.
5. The players continue taking turns until only one person is left in the game. That player is the winner.

(1.01c)



Keeping Skills Sharp

1. $8 + 22,042 + 398 + 25 =$
2. $8,203 - 6,892 =$
3. $3 \times 40 =$
4. $16 \times 3 =$
5. $56 \div 8 =$
6. Which figure is **not** a polygon:
a. trapezoid b. cone c. rhombus d. hexagon
7. Nick had 3 quarters. He spent 40¢ for a popsicle. How much money did he have left?
8. $60,000 + 300 + 50 + 9 =$
9. Cathy and Judy bought some postcard packets. Altogether there were 48 cards. Cathy bought three packets with 8 cards each. The packets Judy bought had 12 cards in each. How many packets did Judy buy?
10. Each of the 6 teachers at Apple Valley School has 21 students. Next week 11 students are moving away. After they move, how many students will be left?



Solve this!

Cecil has a Mysterious Money Machine that will double any amount of money placed in it and add \$5.00 to the doubled amount. Yesterday, he placed a certain amount of money in the box, got a new amount, then placed the new amount back in the box. Then he had \$51.00. How much money did he first place in the Mysterious Money Machine?



(1.05, 5.02)

To the Teacher ..

Grade 4

WEEK
7

Calculate!

1) Answer 100

"Working backward" is one effective strategy

2) 5

"Guess and Check" is an effective strategy.

Thinking Mathematically

Students may be writing story statements rather than story problems. Discuss with them how to write a problem if one part of the equation is unknown. For example: $32 - 19 = \underline{\quad}$ requires a question in the story.

Exploring Data

This activity uses the constant function of a 4-function calculator. Be sure your calculator has a constant function and be aware of how to use it. Some calculators may require keying in $+1=$, $=$, $=$. Extensions: 1) Time the experiment for 30 seconds 2) Use $+ 2 =$, $=$, $=$ or other constants.

Problem of the Week

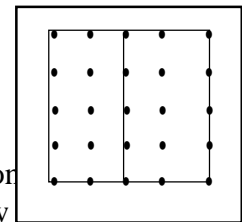
Answer: \$9. Start with final number and work backwards with opposite operations.

$$51 - 5 = 46, 46 \div 2 = 23, 23 - 5 = 18,$$

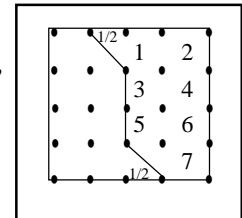
$$18 \div 2 = 9$$

Fraction Action

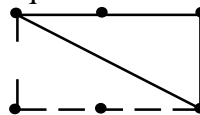
Show students a geoboard divided into halves on the overhead if possible.



Ask how many single squares are on one half. (8) Have volunteers show other ways to divide the geoboard into halves. Demonstrate how 2 half squares equals a whole square, as in this division:



Half of 2 squares also equals one square as in this figure:



$$1/2 \text{ of two squares} = 1$$

$$1/2 + 1/2 = 1 \text{ square (the 8th square)}$$

Students work in pairs to find and record ways to divide the geoboard in half.

Mental Math

Directions to Students: Number your paper from 1 to 8. Write your answers as the questions are called out. Each question will be repeated only once.

1. 30 less than 58
2. $5 \times 2 + 3 - 4$
3. Round to ten: 73
4. $25 + 15$
5. $27 \div 9$
6. 20 minutes after 7:45
7. Number of ounces in 2 pounds
8. Double 21

Keeping Skills Sharp

1. 22,473
2. 1311
3. 120
4. 48
5. 7
6. b cone
7. 35¢
8. 60,359
9. 2
10. 115



Calculate!

The keys 7 and 8 are broken and do not work on your calculator. How would you do this problem on the calculator without using those keys?

275

+823

(1.01b, 1.05)



Thinking Mathematically

How many kernels of unpopped popcorn are in a level quarter cup? How many cups of popped corn does one quarter cup yield? (First, estimate your answers, then experiment.) How many quarter cups do you need to count to talk about the typical number? Discuss range and median.

(4.02)



Exploring Data

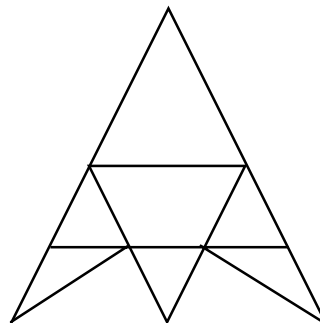
Brainstorm ways in which a region's counties could be organized. (For example, alphabetize, square miles, date of origin, rural or urban, etc.) Choose a region, organize the counties in several ways and create interesting displays.

(4.01)

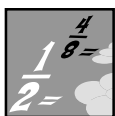


Looking Out For Math

How many triangles can you find?



Create a new triangle puzzle.

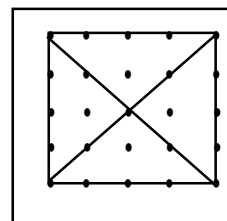
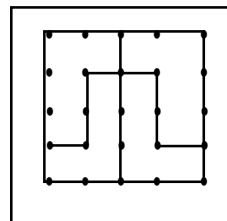


Fraction Action

Divide a geoboard into fourths in as many different ways as you can. Record your solutions on a geoboard record sheet.

How many squares are in each fourth?

How would you prove this geoboard is divided into fourths?



(1.03)

1. Each student needs a game board and at least 20 markers. The same brown bag is shared by all players.
2. Place one set of fraction bars in the bag. Each student takes a turn drawing a fraction bar from the bag and marking one fraction on his gameboard which is equivalent to the fraction shown on the fraction bar. After each turn, return the bar to the bag.
3. The winner is the first student to cover 4 in a row.

Beaufort Bingo



$\frac{1}{4}$	$\frac{3}{4}$	$\frac{2}{3}$	$\frac{1}{12}$	$\frac{3}{6}$
$\frac{1}{2}$	$\frac{5}{12}$	$\frac{1}{3}$	$\frac{2}{4}$	$\frac{2}{6}$
$\frac{4}{4}$	$\frac{0}{3}$	$\frac{4}{6}$	$\frac{3}{3}$	$\frac{3}{12}$
$\frac{10}{12}$	$\frac{2}{2}$	$\frac{8}{12}$	$\frac{5}{6}$	$\frac{4}{12}$
$\frac{7}{12}$	$\frac{0}{2}$	$\frac{9}{12}$	$\frac{1}{6}$	$\frac{11}{12}$



Keeping Skills Sharp

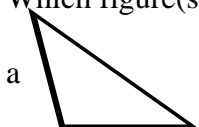
1. $67,192 + 34,501 =$ 2. $8,002 - 3,999 =$

3. $132 \div 4 =$

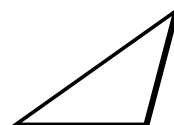
4. $64 \div 8 =$

5. $5 \times 300 =$

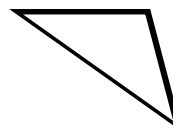
6. Which figure(s) is a reflection (flip) of



b



c



7. 2 gallons = ____ quarts

8. Nearest ten thousand to: 378,402

9. If each car will hold one driver and 5 students, how many cars will be needed to take Mrs. Wilson's 28 students on their field trip?

10. In the village of Etowah, there are 76 places to live. Eighteen are apartment buildings, the rest are houses. There are 32 brick houses. All other houses are wooden homes. How many wooden homes are there?



Solve this!

If vowels are worth 9¢, consonants made with only line segments are worth 4 ¢ and letters with curved lines are worth 7¢, how much is NORTH CAROLINA worth? Find the following:

- the county worth the most.
- the county worth the least.
- any counties worth the same as North Carolina.



(1.05)

To the Teacher ..

Calculate!

$$9 \times 9 = 81$$

$$9 \times 99 = 891$$

$$9 \times 999 = 8991$$

$$9 \times 9999 = 89991$$

$$\text{So: } 9 \times 99999 = 899991$$

Thinking Mathematically

It is important for students to have many experiences predicting outcomes and planning experiments to check their predictions. They need to learn that good scientists and mathematicians make predictions which are often proved wrong, and that it is from these experiences that they learn new ideas. It is equally important that they understand the need for lots of data before we can talk about a "typical" outcome. (The law of large numbers says that the more data you have, the closer your results will be to a mathematically typical outcome.) Their answer to the last question should generate some good discussion. This could be an ongoing experiment which students could do at home.

Game: Beaufort Bingo - 4

You could make the game more challenging by allowing the students to mark all fractions equivalent to the one on the fraction bar. Insist that they prove the equivalence before marking the fraction.

Fraction Action

Use the geoboard record sheet Blackline Master found in Week 18. There are 4 squares in each fourth. To prove that the geoboard is in 4ths, students might record on paper and cut to compare, or count squares and halves of squares.

Exploring Data

An extension of this would be for students to set up a spread sheet with their data, sort their data, use the chart function to display data in a number of ways. Which charts show the data appropriately?

Mental Math

Directions to Students: Number your paper from 1 to 8. Write your answers as the questions are called out. Each question will be repeated only once.

1. Write: five thousand two hundred seven
2. $12 + 5 + 11 - 3$
3. Nearest dollar: \$4.71
4. $16 + 8$
5. $16 \div 8$
6. 15 minutes before 8:00
7. Number of ounces in 4 cups
8. Half of 44

Keeping Skills Sharp

1. 101,693
2. 4,003
3. 33
4. 8
5. 1500
6. a, c
7. 8
8. 8 ten thousands
9. 6 cars
10. 26